PHILIPS 29PT8607

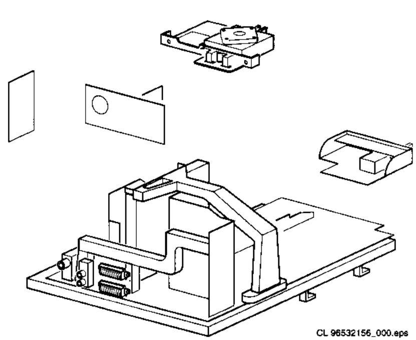
MODEL

SERVICE MANUAL

Colour television

Chassis EM2E AA

Service
Service
Service



Service Manual

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Published by CO 0061 Service PaCE Printed in the Netherlands Subject to modification GB 3122 785 10310

PHILIPS

1. Technical specifications, connection facilities and chassis overview

1.1 Technical specifications

1.1.1 Reception

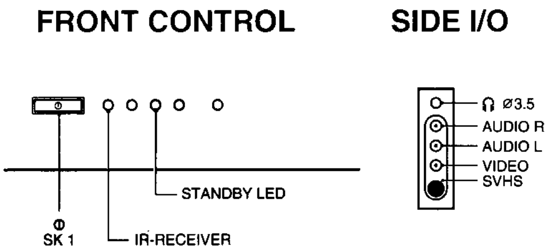
Tuning system : PLL
Reception :
TV systems off air : PAL B/G/I, SECAM B/G/L/L' for Western Europe
: PAL B/G, SECAM B/G/D/K, NTSC M for Eastern Europe
Sound systems : FM
: AM
: NICAM B/G/D/K/I
A/V connections : PAL B/G/D/K/I
: SECAM B/G/D/K/L/L'
: NTSC video playback
Channel selections : 100 channels: VHF, UHF, S-Channels, Hyperband
Frequency range : 44.25 - 855.25 MHz
Aerial input : Coaxial 75Ω
VCR preselections : 0 and 90 - 99

1.1.2 Miscellaneous

Mains voltage : 220V - 240V (± 10 %); 50 - 60Hz (± 5 %)
Ambient temperature : +5 to +45 deg. Celcius
Standby Power Consumption : < 1W

1.2 Connection facilities

1.2.1 Side I/O connections



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060100

Figure 1-1

Audio / video

- - Video (CVBS)	1V_{PP} / 75Ω	→○ ◎
- - Audio	L (0.5V_{RMS} / 10kΩ)	→○ ◎
- - Audio	R (0.5V_{RMS} / 10kΩ)	→○ ◎
- - Headphone	(32 - 2000Ω / 10mW)	◎ / Ω

SVHS

1 -	GND	⏚
2 -	GND	⏚
3 - Y	(1V_{PP} / 75Ω)	→○
4 - C	(0.3V_{PP} / 75Ω)	→○

1.2.2 Rear connections

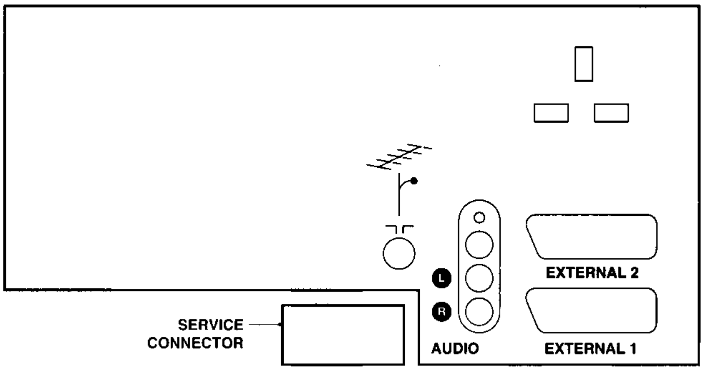

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Figure 1-2

Audio

- - Audio	L (0.5V_{RMS} / 10kΩ)	○→ ◎
- - Audio	R (0.5V_{RMS} / 10kΩ)	○→ ◎

External 1 (in/out): RGB+CVBS

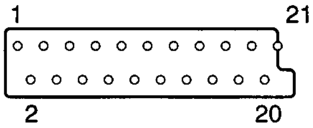

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Figure 1-3

1 - Audio	R (0.5V_{RMS} / 1kΩ)	○→
2 - Audio	R (0.5V_{RMS} / 10kΩ)	→○
3 - Audio	L (0.5V_{RMS} / 1kΩ)	○→
4 - Audio	GND	⏚
5 - Blue	GND	⏚
6 - Audio	L (0.5V_{RMS} / 10kΩ)	→○
7 - Blue	(0.7V_{PP} / 75Ω)	→○
8 - CVBS-status	0 - 1.3V: INT, 4.5 - 7V: EXT 16:9, 9.5 - 12V: EXT 4:3	
9 - Green	GND	⏚
10-		
11- Green	(0.7V_{PP} / 75Ω)	→○
12-		
13- Red	GND	⏚
14- RGB-status	GND	⏚
15- Red	(0.7V_{PP} / 75Ω)	→○
16- RGB-status	0 - 0.4V: INT 1 - 3V: EXT / 75Ω	
17- CVBS	GND	⏚
18- CVBS	GND	⏚
19- CVBS	(1V_{PP} / 75Ω)	○→
20- CVBS	(1V_{PP} / 75Ω)	→○
21- Earth	GND	⏚

External 2 (in/out): SVHS+CVBS (intended for VCR)

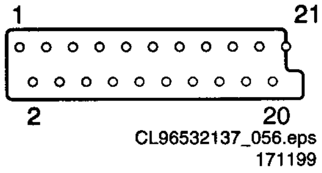
1
21
2
20
CL96532137_056.eps
171199

Figure 1-4

1 - Audio	R (0.5V_{RMS} / 1kΩ)	○→
2 - Audio	R (0.5V_{RMS} / 10kΩ)	→○
3 - Audio	L (0.5V_{RMS} / 1kΩ)	○→
4 - Audio	GND	⏚
5 -	GND	⏚
6 - Audio	L (0.5V_{RMS} / 10kΩ)	→○
7 -		
8 - CVBS-status	0 - 1.3V: INT, 4.5 - 7V: EXT 16:9, 9.5 - 12V: EXT 4:3	
9 -	GND	⏚
10-	Easy link	
11-		
12-		
13- Red	GND	⏚
14- RGB-status	GND	⏚
15- C	(0.7V_{PP} / 75Ω)	→○
16-		
17- CVBS	GND	⏚
18- CVBS	GND	⏚
19- CVBS	(1V_{PP} / 75Ω)	○→
20- Y/CVBS	(1V_{PP} / 75Ω)	→○
21- Earth	GND	⏚

1.3 Chassis overview

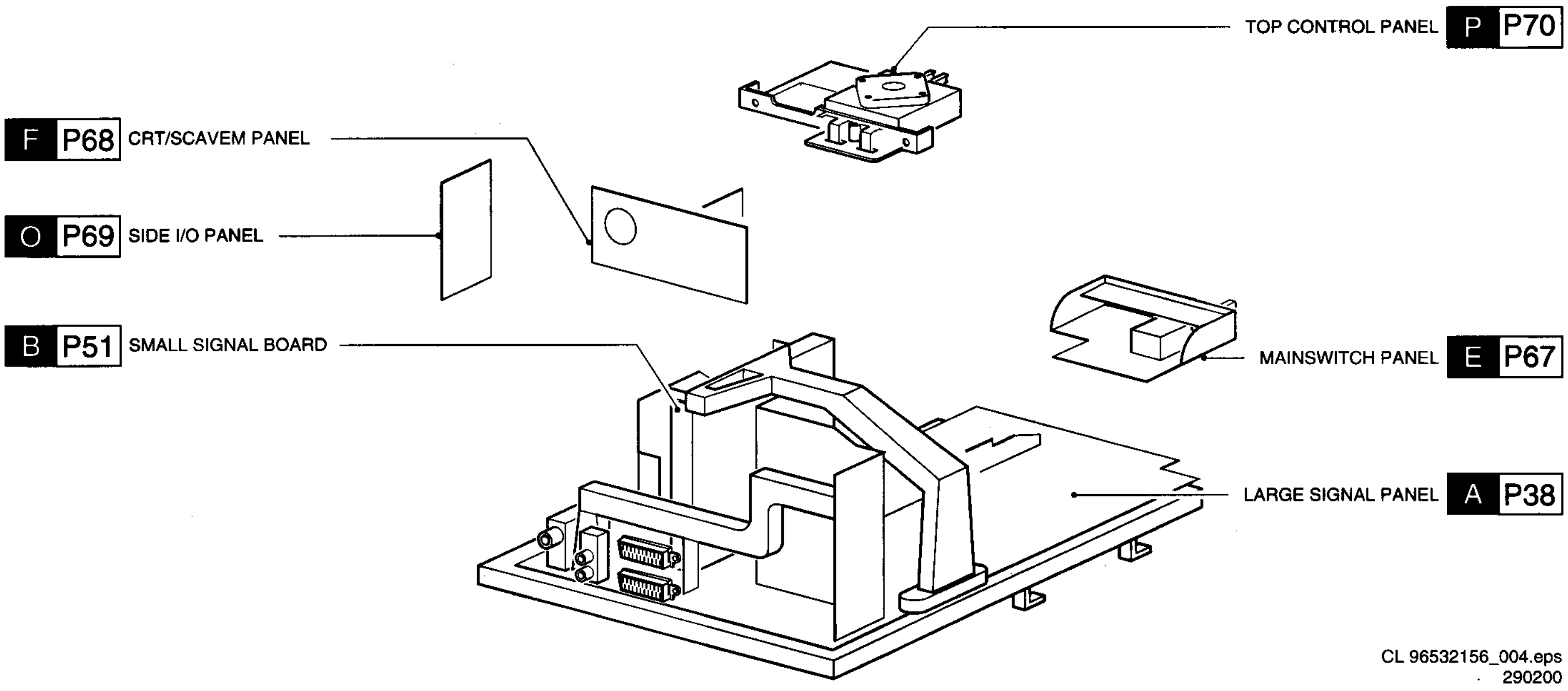
P P70 TOP CONTROL PANEL
F P68 CRT/SCAVEM PANEL
O P69 SIDE I/O PANEL
B P51 SMALL SIGNAL BOARD
E P67 MAINSWITCH PANEL
A P38 LARGE SIGNAL PANEL
CL 96532156_004.eps
290200

Figure 1-5

2. Safety & Maintenance instructions, Warnings and Notes

2.1 Safety instructions for repairs

Safety regulations require that during a repair:

- Due to the EM2E concept, a very large part of this chassis (incl. Hor. & Vert. deflection) is 'hot'. Therefore the set must be connected to the mains via an isolating transformer.
- Safety components, indicated by the symbol ⚠, should be replaced by components identical to the original ones.
- When replacing the CRT, safety goggles must be worn.

Safety regulations require that after a repair, the set must be returned in its original condition. In particular attention should be paid to the following points:

- General repair instruction: as a strict precaution, we advise you to resolder the solder joints, through which the horizontal deflection current is flowing, in particular:
  - All pins of the line output transformer (LOT);
  - Fly-back capacitor(s);
  - S-correction capacitor(s);
  - Line output transistor;
  - Pins of the connector with wires to the deflection coil;
  - Other components through which the deflection current flows.

Note: This resoldering is advised to prevent bad connections due to metal fatigue in solder joints and is therefore only necessary for television sets older than 2 years.

- The wire trees and EHT cable should be routed correctly and fixed with the mounted cable clamps.
- The insulation of the mains lead should be checked for external damage.
- The mains lead strain relief should be checked for its function in order to avoid touching the CRT, hot components or heat sinks.
- The electrical DC resistance between the mains plug and the secondary side should be checked (only for sets which have a mains isolated power supply). This check can be done as follows:
  - Unplug the mains cord and connect a wire between the two pins of the mains plug;
  - Set the mains switch to the 'ON' position (keep the mains cord unplugged!);
  - Measure the resistance value between the pins of the mains plug and the metal shielding of the tuner or the aerial connection on the set. The reading should be between 4.5 MΩ and 12 MΩ.
  - Switch off the TV and remove the wire between the two pins of the mains plug.
- The cabinet should be checked for defects to avoid touching of any inner parts by the customer.

2.2 Maintenance instructions

It is recommended to have a maintenance inspection carried out by a qualified service employee. The interval depends on the usage conditions:

- When the set is used under normal circumstances, for example in a living room, the recommended interval is 3 to 5 years.
- When the set is used in circumstances with higher dust, grease or moisture levels, for example in a kitchen, the recommended interval is 1 year.
- The maintenance inspection contains the following actions:
  - Execute the above-mentioned 'general repair instruction'.
  - Clean the power supply and deflection circuitry on the chassis.
  - Clean the picture tube panel and the neck of the picture tube.

2.3 Warnings

- In order to prevent damage to IC's and transistors, all high-voltage flashovers must be avoided. In order to prevent damage to the picture tube, the method shown in Fig. 2-1 should be used to discharge the picture tube. Use a high-voltage probe and a multimeter (position VDC). Discharge until the meter reading is 0 V (after approx. 30 s).
- ⚠ All IC's and many other semiconductors are susceptible to electrostatic discharges (ESD). Careless handling during repair can reduce life drastically. When repairing, make sure that you are connected with the same potential as the mass of the set by a wristband with resistance. Keep components and tools also at this same potential.
- Together with the deflection unit and any multipole unit, the used flat square picture tubes form an integrated unit. The deflection and the multipole units are set optimally at the factory. Adjustment of this unit during repair is therefore not recommended.
- Be careful during measurements in the high-voltage section and on the picture tube.
- Never replace modules or other components while the unit is switched ON.
- When making settings, use plastic rather than metal tools. This will prevent any short circuits and the danger of a circuit becoming unstable.
- Wear safety goggles during replacement of the picture tube.

2.4 Notes

- The direct voltages and oscillograms should be measured with regard to the tuner earth (⏚) or hot earth (⏚).
- The direct voltages and oscillograms shown in the diagrams are indicative and should be measured in the Service Default Mode (see chapter 5) with a colour bar signal and stereo sound (L: 3 kHz, R: 1 kHz unless stated otherwise) and picture carrier at 475.25 MHz.
- Where necessary, the oscillograms and direct voltages are measured with (⏉) and without (⏉̸) aerial signal. Voltages in the power supply section are measured both for normal operation (①) and in Standby (⏻). These values are indicated by means of the appropriate symbols.
- The picture tube PWB has printed spark gaps. Each spark gap is connected between an electrode of the picture tube and the Aquadag coating.
- The semiconductors indicated in the circuit diagram and in the parts lists are completely interchangeable per position with the semiconductors in the unit, irrespective of the type indication on these semiconductors.
- Manufactured under license from Dolby Laboratories Licensing Corporation. DOLBY, the double D symbol and PRO LOGIC are trademarks of Dolby Laboratories Licensing Corporation.

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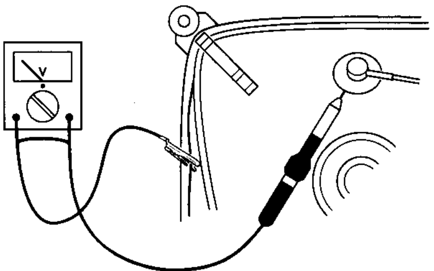

2-1

3. Directions for use

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Preparation **3**
Installation **4**
Store TV channels **4**
  Select the menu language and country **4**
  Automatic installation **5**
  Manual installation **5**
Give name **6**
Reshuffle the programme list **6**
Select favourite TV channels **6**
Install TV setup **7**

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  Sound menu **10**
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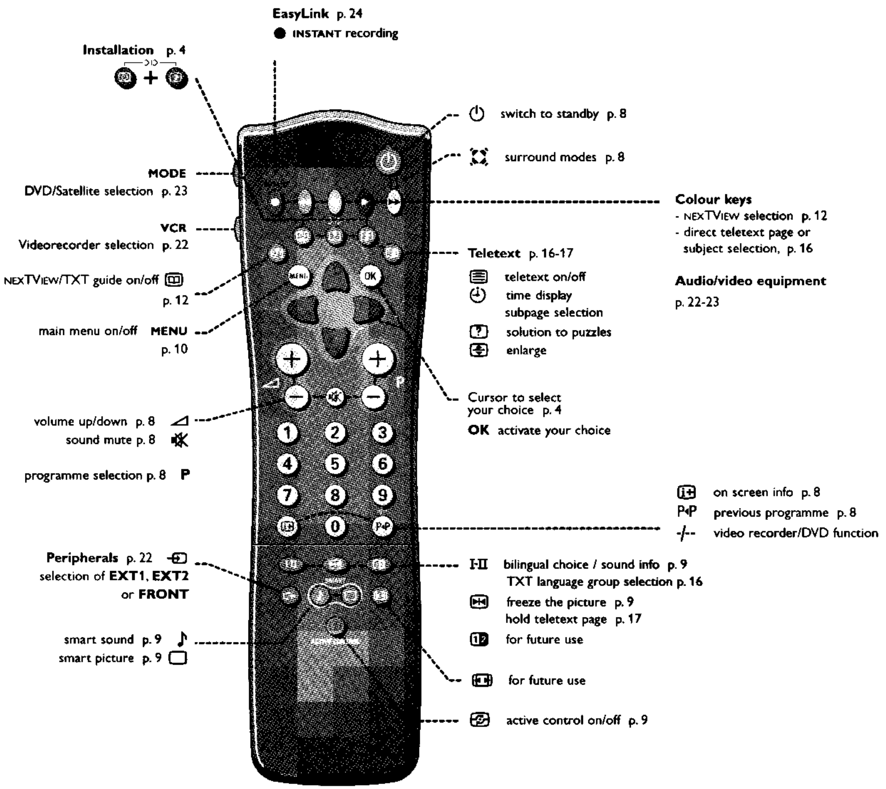
EasyLink features are based on the "one touch operation" approach. This means that a sequence of actions are executed at the same time in both the television and the video cassette recorder, ***provided both are fitted with the EasyLink function*** *and connected with the eurocable supplied with your video recorder.*

English

Preparation

Your remote control


EasyLink p. 24
● INSTANT recording
Installation p. 4
MODE
DVD/Satellite selection p. 23
VCR
Videorecorder selection p. 22
NEXTVIEW/TXT guide on/off p. 12
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subpage selection
solution to puzzles
enlarge
Cursor to select your choice p. 4
OK activate your choice
Colour keys
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-/-- video recorder/DVD function
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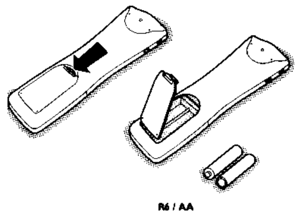
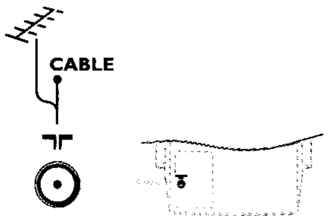
freeze the picture p. 9
hold teletext page p. 17
for future use
for future use
active control on/off p. 9
OK
MENU
P
1
2
3
4
5
6
7
8
9
0
P◂P



Preparation

❶ **Place the TV on a solid surface.**
For ventilation, leave at least 5 cm free all around the TV.
Do not place the TV on a carpet.
To prevent any unsafe situations, do not place any objects on top of the TV.
Avoid heat, direct sunlight and exposure to rain or water.

❷ **Insert the aerial plug** firmly into the aerial socket ⊤ at the back of the TV.



❸ Insert the mains plug in the wall socket having a mains voltage of 220V-240V.
To prevent damaging the mains (AC) cord which could cause a fire or electric shock, do not place the TV on the cord.

❹ Remote control: Remove the cover of the battery compartment.
Insert the 2 batteries supplied (Type R6-1.5V).

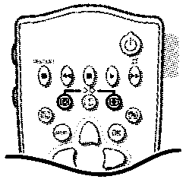
The batteries supplied do not contain the heavy metals mercury and cadmium. Nevertheless in many countries exhausted batteries may not be disposed of with your household waste. Please check on how to dispose of exhausted batteries according to local regulations.

Note: this remote control functions with TVs which use the RC6 signalling standard.

❺ **Switch the TV on** : Press the power switch ⏻ on the front of your TV.
A red indicator on the front of the TV lights up and the screen comes on.
If the TV is in standby mode (see p. 8), press the **- P+** key on the remote control.
When you switch on your set ***for the first time****, the menu* **LANGUAGE** *automatically appears on the screen. The explanation appears in different languages one at a time. Choose your own language and press the* **OK** *key on the remote control.*

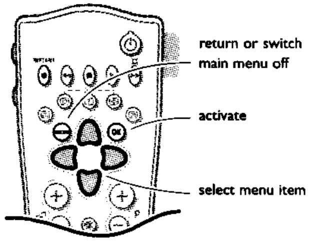
Go on to page 4, Store TV channels.

Installation



Select the INSTALLATION menu

Press ⓪ and ⊜ at the same time.

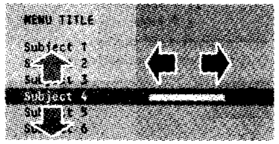


To use the menus

❶ Use the cursor in the up/down, left/right directions to select a menu item.

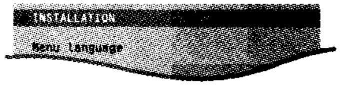
❷ Press the **OK** key to activate.

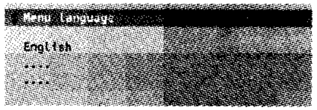
❸ Use the **MENU** key to return or to switch the menu off.

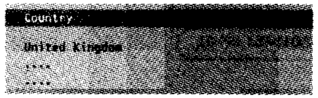


Store TV channels

After the new or extra TV channels have been stored, the TV automatically transfers those TV channels to the video recorder if it is equipped with the EasyLink function. The message ***EasyLink : downloading ......*** *appears on the screen. The programme list of the video recorder is now the same as the one of the TV. If the TV is connected to a video recorder which supports the NEXTVIEWLink function, the TV also automatically transfers the language and country selections to the video recorder.*







Select the menu language and country

First, select your language and country.

❶ Select **Menu language** and press the **OK** key.

❷ Select your language and press the **OK** key.
Use the cursor up/down to scroll through the list and to bring up other languages which are not displayed on the screen at present.

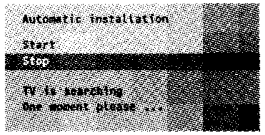
❸ Select **Country** and press the **OK** key.

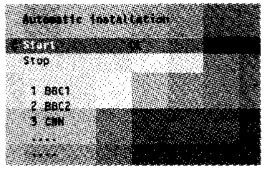
❹ Select the country where you are now located and press the **OK** key.
Use the cursor up/down to scroll through the list and bring up other countries which are not displayed on the screen at present.

Select **Other** when none of the countries applies.

You can now search for and store the TV channels in two different ways: using **automatic installation** or **manual installation** (tuning-in channel by channel).
Select your choice and press the **OK** key.

Automatic installation


Automatic installation
Start
Stop
TV is searching
One moment please ...


Automatic installation
Start OK
Stop
1 BBC1
2 BBC2
3 CNN
....
....

In the Automatic installation menu select **Start** and press the **OK** key to activate the searching. All TV channels are searched for and stored automatically.

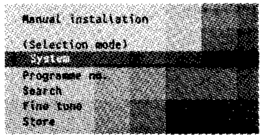
If a cable system which broadcasts ACI (Automatic Channel Installation) or a TV channel transmitting a teletext page with the frequencies and programme names of all the TV channels which can be received, is detected, the search is stopped and a programme list appears.
The programme list is automatically filled with all the programme numbers and names of the TV channels transmitted.

It is possible that the cable company or the TV channel displays a broadcast selection menu. Layout and items are defined by the cable company or the TV channel. Make your choice with the cursor and press the ***OK*** *key.*

To exit from the menu press the **MENU** key on the remote control.

Go on to page 6.

Manual installation


Manual installation
(Selection mode)
System
Programme no.
Search
Fine tune
Store

Searching for and storing TV channels is done channel by channel.
You must go through every step of the Manual installation menu.

Selection mode is only present and lights up if the country selected also offers the channel option (C-channels for aerial channels, S-channels for cable channels).
You can choose either channel or frequency mode.

❶ Select the TV system
Select the country or part of the world from where you want to receive the TV channel.
If you are connected to a cable system, select your country or part of the world where you are now located.

❷ Press the cursor down and enter the programme number with the digit keys.

❸ Search for a TV channel
Press the cursor left/right.
The frequency or the channel number increases until a TV channel is found.

Direct selection of a TV channel
If you know the frequency, the C- or S-channel number, enter it directly with the digit keys 0 to 9.
Ask for a list from your cable company or dealer, alternatively consult the Table of frequencies on the inside backcover of this handbook.

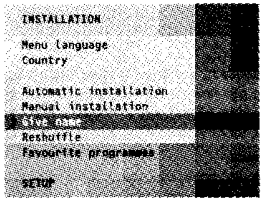
❹ Fine tune
In case of poor reception, you can improve the reception by adjusting the frequency with the cursor left/right.

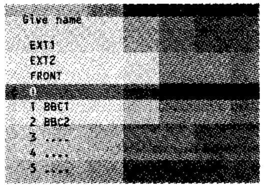
❺ To store your TV channel, select **Store** and press the **OK** key.

Repeat steps ❶ to ❺ to store another TV channel.

❻ To exit from the menu press the **MENU** key on the remote control.

Give name


INSTALLATION
Menu language
Country
Automatic installation
Manual installation
Give name
Reshuffle
Favourite programmes
SETUP

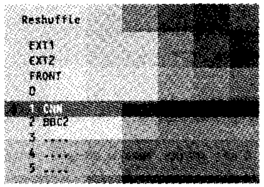

Give name
EXT1
EXT2
FRONT
0
1 BBC1
2 BBC2
3 ....
4 ....
5 ....

It is possible to change the name stored in the memory or to assign a name to a TV channel which has not yet been entered. A name with up to 5 letters or numbers can be given to the programme numbers 0 to 99. For example SUPER, BBC1,... Between 99 and 0 you can also name any peripherals that are connected to a euroconnector.

❶ Select **Give name** in the **INSTALLATION** menu and press the **OK** key.
❷ Select the programme number.
❸ Press the **OK** key.
❹ Select the character with the cursor up/down.
❺ Select the following position with the cursor right.
❻ Select the following character.
❼ Press the **OK** key when finished.
❽ Press the **MENU** key to return to the **INSTALLATION** menu.

Space, numbers and other special characters are located between Z and A.

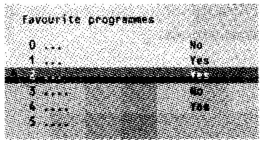
Reshuffle the programme list


Reshuffle
EXT1
EXT2
FRONT
0
1 CNN
2 BBC2
3 ....
4 ....
5 ....

According to your preference you **can** change the order of the stored TV channels.

❶ Select **Reshuffle** in the **INSTALLATION** menu and press the **OK** key.
❷ Select the programme number you want to exchange.
❸ Press the **OK** key.
❹ Select the new number you want to exchange it with.
❺ Press the **OK** key.
Repeat the operation until all TV channels are allocated as you like.
❻ Press the **MENU** key to return to the **INSTALLATION** menu.

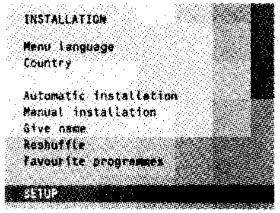
Select Favourite TV channels

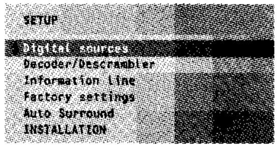

Favourite programmes
0 ... No
1 ... Yes
2 ... Yes
3 .... No
4 .... Yes
5 ....

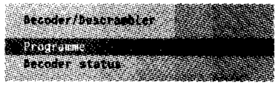
After leaving the installation you can browse through the TV channels by pressing the **- P +** key. Only those TV channels which are in the favourite list will be displayed. Non-favourite TV channels can still be selected with the digit keys. By default all stored channels are added to the favourite list.

❶ Select **Favourite programmes** in the **INSTALLATION** menu and press the **OK** key.
❷ Select your favourite programme number.
❸ Select **Yes** or **No** with the cursor left/right.
❹ Repeat for every TV channel you want to make a favourite or a non-favourite TV channel.
❺ Press the **MENU** key to return to the **INSTALLATION** menu.

In order for NEXTVIEW *to function properly, the first TV channel from the favourite list should also broadcast the correct local date and time via teletext.*







Install TV Setup

The Setup menu allows you to adjust initial settings, i.e. those which are not related to the installation of the TV channels.
The Setup menu contains items that control the settings of the TV's functions, features, services and peripherals you may have connected.

❶ Use the cursor in the up/down, left/right directions to select the menu item.
❷ Use the **OK** key to activate.
❸ Use the **MENU** key to return or switch menu off.

Digital sources
See Connect Peripheral Equipment, p. 20 to connect your digital equipment, like a DVD, a digital satellite tuner or a similar digital device.

Define Decoder/Descrambler programme numbers
If a decoder or a descrambler is connected, see p. 19 you can define one or more programme numbers as decoder programme numbers.

Press the cursor left/right to select the input used to connect to your decoder **Off**, **EXT1** or **EXT2**.
Select **Off** if you do not want the selected programme number being activated as a decoder programme number.

Select **EXT2** *when the decoder is connected to your EasyLink video recorder.*
When selecting the decoder, the message ***EasyLink: downloading presets....*** *appears on the screen.*

Information line
Select **On** and after the selection of a TV programme or after pressing the [i+] key on the remote control, a TV channel which broadcasts teletext may transmit the name of the TV channel, the programme name or another message. This is displayed on screen next to information about sound.
When selected **Off**, only sound information is displayed after the selection of a TV channel or after pressing the [i+] key.

Factory settings
Select **Factory settings** and press the **OK** key to restore picture and sound settings, predefined in the factory.

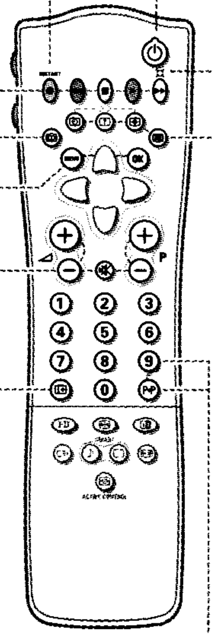
Auto Surround
Sometimes the broadcaster transmits special signals for Surround Sound encoded programmes. In that case, the TV automatically switches to the best Surround Sound mode when Auto Surround is switched on. Virtual Dolby will be reproduced, see p. 8.
Overruling this surround mode remains possible.

Installation
Select **Installation** and press the **OK** key to return immediately to the **INSTALLATION** menu.

❹ To exit from the menu press the **MENU** key repeatedly.

Operation

Use of the remote control



● **Instant record**
If your video recorder has the EasyLink function the **INSTANT** ● key for record can be operated in the TV mode.

● ◀◀ ■ ▶ ▶▶ **Video recorder** see p. 22

NEXTVIEW/TXT guide on/off see p. 12

MENU **Main menu** on/off see p. 10

OK Press this key to activate your choice, when in the menus.

◿ **Volume**
Press + or - to adjust the volume.

Mute
Temporarily interrupt the sound or restore it.

P **Programme selection**
To browse through the TV channels activated in the Favourite Programme menu.

[i+] **Screen information**
Press for 5 seconds to activate/de-activate the extended or reduced display of TV channel and programme information on the screen.
Press briefly to display information about the selected TV channel and programme, the sound reception, picture settings and the remaining time set with the sleeptimer.

⏻ **Standby**
The set is switched off.
To switch the TV on again, press - **P** + or the digit keys.
If your EasyLink video recorder has the system standby function and you press the standby key for 3 seconds, both the TV and **video recorder are switched to standby.**
Your TV consumes energy in the standby mode. Energy consumption contributes to air and water pollution. We advise to switch off your TV overnight instead of leaving it on standby. You save energy.

Surround modes
Incredible Surround
- In **MONO** sound mode, this feature, when switched on, enables you to hear a spatial effect of sound.
- In **STEREO** sound mode, when **Incredible Surround** is selected, it seems as though the loudspeakers are spread further apart from one another.

Virtual Dolby *(optimal with Dolby Surround signals)*
Virtual Dolby enables you to experience the effect of Dolby Surround Pro Logic, reproducing a rear sound effect

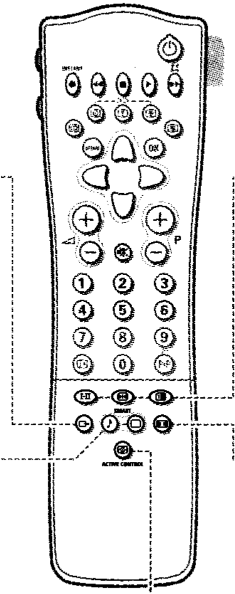
Teletext on/off see p. 16

[?] **Teletext functions** see p. 17

Time display
The time, downloaded from the TV channel (with teletext) stored on programme number **1** or the lowest favourite programme number, is displayed on the screen.
This function is not available when continuous subtitles have been switched on.

0/9 **Digit keys**
To select a TV channel.
For a two digit programme number, enter the second digit within 2 seconds.
To switch immediately to a selected one digit TV channel, keep the digit key pressed a bit longer.

P◁P **Previous programme**
The previously selected TV channel is displayed.
The -/-- indication is only video recorder/DVD.



Select peripherals

Press this key repeatedly to select **EXT1**, **EXT2** or **FRONT**, according to where you connected the peripherals (p. 22).

Smart Keys

To select predefined picture and sound settings.

Smart Sound

Each time it is pressed, a different sound setting is selected, corresponding with specific factory setting of the equalizer.

Smart Picture

Each time it is pressed, a different picture setting is selected, corresponding with specific factory settings of Contrast, Colour, Sharpness and Dynamic Contrast.

Personal refers to the personal preference settings of picture and sound selected in the picture and sound menu.
Remark: the moment you are in a predefined smart sound or picture setting and you modify a setting in the picture or sound menu, all values of the menu will overwrite the previously made settings.

I-II Bilingual choice and sound mode selection

Press this key
- to switch from **Stereo** to **Mono** sound, in case of stereo transmission, or from **Nicam Stereo** to **Nicam available**, in case of digital transmission;
- to choose between language I (Dual I) or language II (Dual II), in case of bilingual transmission. The setting is separately stored for each TV channel.

Freeze

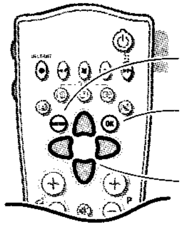
To activate/de-activate the frozen picture or to hold a teletext page.

for future use

for future use

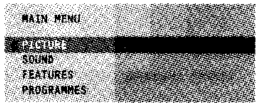
Active control

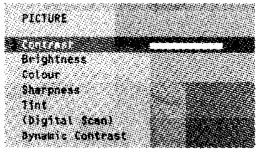
Active control is a pro-active and automatic system. The TV continuously measures and corrects all incoming signals in order to provide the best picture possible.
Press the key to select the Active Control values Off or On.
Off Sharpness and Dynamic Contrast are controlled automatically
On Sharpness, Dynamic Contrast and Noise Reduction are controlled automatically.
Press the cursor in the up/down directions while the selected Active Control setting information is on top of the screen.
The Active Control menu appears.
The picture settings are being adapted continuously and automatically.
The menu items cannot be selected.
Press the cursor in the up/down directions again to switch off the menu.


return or switch main menu on/off
OK key to activate
cursor to select adjustments

Use of the menus

1. Press the **MENU** key to display/cancel the **MAIN MENU**.
2. Use the cursor in the up/down directions to select the **PICTURE**, **SOUND** or **FEATURES** menu or to select the **PROGRAMMES**.
3. Press the cursor right to activate the selected menu.
4. Use the cursor in the up/down, left/right directions to select the menu item.
5. Use the **OK** key to activate.
6. Press the **MENU** key repeatedly to **return** or to switch the menu off.





Picture menu

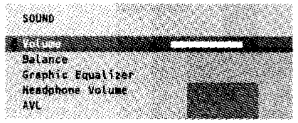
If an NTSC peripheral is connected to one of the euroconnectors, the option Hue also appears.

Tint
Select the colour temperature: **Normal**, **Warm** or **Cool**.

Digital Scan (Line Flicker Reduction) *(if provided)*
In certain circumstances while watching TV programmes it may be preferable to switch off the digital scan line flicker reduction.
Press the cursor left/right to select **On** of **Off**.

Dynamic Contrast
To make the contrast in the darker and the brighter picture areas more noticeable, select the **Med** setting.
In certain circumstances it may be preferred to select **Min**, **Max** or **Off**.

The modified adjustments for Contrast, Brightness, Colour, Sharpness, Tint, (Digital Scan) and Dynamic Contrast are automatically stored for all TV channels.
Select **Factory settings** in the Setup menu to restore the predefined factory settings, see p. 7.



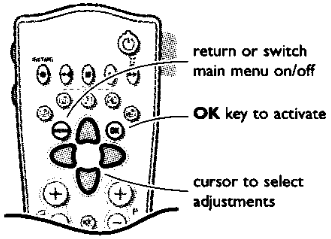
Sound menu

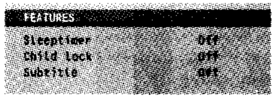
The modified adjustments for Volume, Balance, Treble and Bass are automatically stored for all TV channels.
Select **Factory settings** in the Setup menu to restore the predefined factory settings, see p. 7.

Graphic Equalizer
Here you can select the preferred sound setting which corresponds with the personal sound settings.

Headphone volume
See Connect Peripheral Equipment, p. 21, for the connection of the headphone.

AVL (Automatic Volume Leveller)
AVL automatically controls the volume level to avoid too large level differences, especially when switching to another programme or during commercial breaks.


return or switch main menu on/off
OK key to activate
cursor to select adjustments



Sleeptimer Off
Child lock Off
Subtitle Off

Features menu

❶ Press the **MENU** key to display/cancel the **MAIN MENU**.
❷ Use the cursor in the up/down directions to select the **FEATURES** menu.
❸ Press the cursor right to activate the selected menu.
❹ Use the cursor in the up/down directions to select a menu item.
❺ Use the cursor in the left/right directions to select the desired setting.

Sleeptimer

With the sleeptimer you can set a time period after which the TV should switch itself to standby.
The counter runs from **Off** up to **180 min.**
One minute before the TV is set to go to standby, the remaining seconds appear on screen. You can always switch off your set earlier or change the set time.

Child lock

If the child lock is on, the TV can only be switched on with the remote control. The **P** - and + keys on top of the TV cannot be used to select a TV channel. In this way you can prevent unauthorised use of your TV.
If the message **Child lock On** appears, the child lock must be switched off before you can use the **P** - and + keys on top of the TV to select a TV channel.

Subtitle

TV channels with teletext often transmit certain programmes with subtitling. See Teletext, Continuous Subtitles, p. 18 how to select the proper subtitle page from the teletext index.
Select **Subtitle On** or **Off**.

Press the **MENU** key to switch off the Features menu.

Programme list

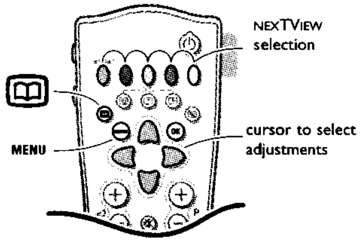
❶ Press the **MENU** key to display/cancel the **MAIN MENU**.
❷ Select **PROGRAMMES** with the cursor up/down.
❸ Press the cursor right to display an overview of all the TV channels installed.
❹ Press the cursor up/down to run through the list and press **OK** to select the desired TV channel.
❺ Press the **MENU** key to switch off the Programme list.

NexTView / Teletext Guide

Today, most broadcasters in Europe, are offering teletext pages containing their programme schedule of today. These pages can be requested by switching the TV to **Teletext Guide**.
An increasing number of broadcasters are offering an extended programme guide service called **NexTView**. NexTView is a new way of presenting programme schedules and offers more features than common teletext.
With NexTView it is possible to show for instance all the movies coming tonight.

Both facilities are integrated in this TV: NexTView and Teletext Programme Guide. If a TV channel supports NexTView then the TV will automatically present the NexTView programme schedule. If the TV channel supports just teletext, then the TV will switch automatically to Teletext Guide.
Both facilities are offering the same functions: record, remind and info.
However in case of Teletext Guide the broadcaster is responsible if these functions are possible.
You can search for the programmes you want to watch up to 7 days in advance. It is also possible to search for a programme by theme, e.g. sport, movie, etc. Once a programme has been selected it can be tagged, to remind you, or to record on the video recorder automatically (provided the video recorder is equipped with NexTViewLink, level 2.0), once, daily, weekly or series. Teletext Guide/NexTView also allows direct access to detailed information about programmes if provided by the broadcaster.

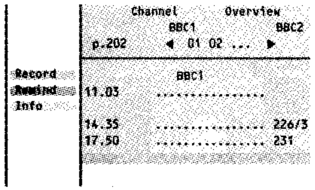
The broadcaster is responsible for the contents of the information.
The TV is responsible for the capture of that information and for the presentation to the user.



Use of the Teletext Guide/NexTView menus

❶ Press the 📖 key on the remote control to display/cancel the Teletext Guide/ NexTView menu.
❷ Use the cursor in the up/down, left/right directions to select the date, **CHANNEL** for the channel guide, **THEME** for the theme guide, **OVERVIEW** for an overview of all the programmes which are marked as reminders or for recording, the programme guide page number or to enter the programme list.

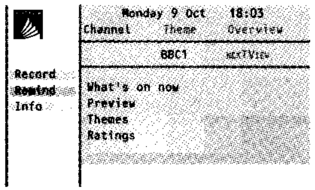
Teletext Guide



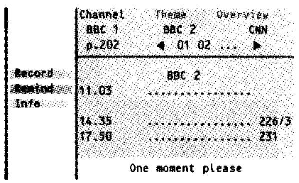
BBC1
11.03 ....
14.35 .... 226/3
17.50 231

❸ Enter the proper programme guide page number with the digit keys or with the – **P** + keys.
❹ Press the cursor left/right to run through the subpages.
❺ Select a programme with the cursor up/down.
❻ Press one of the colour keys to select one of the basic functions (if available); **record, remind, info.** See Basic functions further on.
❼ Press the **OK** key to return to the header area again.

NexTView



❸ Select a programme with the cursor up/down.
❹ Press one of the colour keys to select one of the basic functions (if available); **record, remind, info.** See Basic functions further on.
❺ Press the **OK** key to return to the header area again.



```
          Channel    Theme    Overview
           BBC 1     BBC 2       CNN
           p.202    ◄ 01 02 ...  ►
Record               BBC 2
Remind    11.03     ................
Info
          14.35     ................ 226/3
          17.50     ................ 231
                One moment please
```

Teletext guide

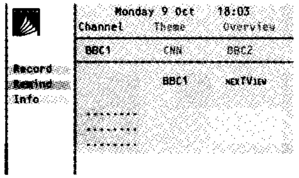
TV channels which broadcast teletext also transmit a page with the programme guide of the day. For each selected TV channel the programme guide page can be selected with the 📖 key:

- automatically if the selected TV channel supports services like PDC (Programme Delivery Control) or MIP (Magazine Inventory Page).
- if automatic pre-selection is not possible then the index page is displayed and the proper programme guide page number of the selected TV channel has to be entered with the digit keys.

The programme guide page will be stored automatically only if it satisfies Video Programming via Teletext (VPT) requirements.

Every time you press the 📖 key, the programme guide page of the selected TV channel will be available if the TV channel does not support NEXTVIEW.

The function items record, remind and info, corresponding with the coloured keys, become highlighted if the displayed programme page satisfies the Video Programming via Teletext (VPT) requirements. Select a programme item and press one of the function keys, e.g. Record or Remind. See Basic functions further on.
The Info item is enabled if the selected programme contains a page number with an optional subcode referring to a page with more info about the programme.

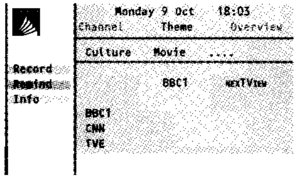


```
          Monday 9 Oct   18:03
          Channel    Theme    Overview
           BBC1       CNN      BBC2
Record               BBC1     NEXTVIEW
Remind
Info
           ........
           ........
           ........
```

NEXTVIEW modes to sort and represent information

Channel

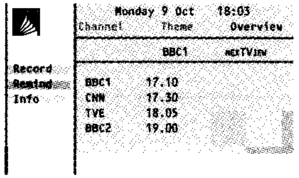
The Channel guide provides an overview of all programmes that are broadcast by a single channel during one day.
Already passed programmes can be made visible via cursor up.
The list will start with the earliest broadcast programme.
With cursor left/right another favourite TV channel can be selected.



```
          Monday 9 Oct   18:03
          Channel    Theme    Overview
           Culture   Movie  ....
Record               BBC1     NEXTVIEW
Remind
Info
           BBC1
           CNN
           TVE
```

Theme

The theme guide displays a list of all programmes at the selected date, that matches with the selected category (news, sport, culture, movies, ...).
The default starting item will be the current or next programme on the current TV channel.
The **THEME** selection is only present if programmes in the TV guide have defined themes.



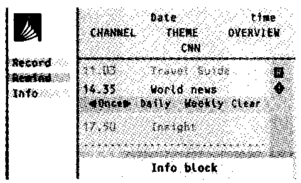
```
          Monday 9 Oct   18:03
          Channel    Theme    Overview
                     BBC1     NEXTVIEW
Record
Remind     BBC1      17.10
Info       CNN       17.30
           TVE       18.05
           BBC2      19.00
```

Overview

The Overview menu provides a list of programmes that are marked as reminders or to be recorded each day.
When more than one programme to be recorded has an overlap in time, these programmes will be marked by a red colour.

After the programme has been broadcast, all items set for once will be deleted from the list the following day. This menu can be used to change a reminder or recorder.

Note: the TV will automatically interpret the broadcast time (as shown on the teletext guide) of your selected programme into the correct local time and date.



```
                   Date           time
          CHANNEL    THEME    OVERVIEW
                      CNN
Record    11.03     Travel Guide     R
Remind    14.35     World news       ◆
Info      ◄Once► Daily  Weekly Clear
          17.50     Insight
          ..........................
                 Info block
```

Basic functions

The functions Record, Remind and Info can be activated with the corresponding colour keys on the remote control.
If the function is not available, then the text is shown at reduced brightness.
Select a programme with the cursor up/down.

Record R or Remind ◆

❶ Press the red colour key to activate **Record** or the green colour key to activate **Remind.**
If the programme number of the broadcaster is not yet known, a message appears with the request to input the correct programme number with the cursor left/right and press OK.
A small menu pops up in which you can choose the interval: once, daily or weekly, or clear an earlier made record or remind setting. The default interval is set to **Once**. If a programme is an episode of a series, it is identified by the system and the options **daily** and **weekly** are replaced by the option **series**. In this case the system identifies when the next episode of the series will be broadcast. This is not possible in the Teletext guide.

❷ Use the cursor in the left/right directions to select the interval.
The colour of the tag refers to the interval.

❸ Press the **OK** key.

When **Record** R is activated:
Storing is displayed to indicate the video recorder is programmed.
When **Remind** ◆ is activated:
- a message will be displayed the moment the tagged programme with ◆ starts, when watching the TV later on.
- the TV switches on the moment the tagged programme with ◆ starts, when the TV is in standby.

Note: Recordings and reminders are not possible when the broadcaster does not transmit dates and times of the programmes.
*The message **No TV programming possible** appears.*
Make sure you are on the TV programming page.

Info

❶ Press the yellow colour key to activate **Info.**
Advertisements or information relating to the selected programme are displayed. In some cases all of the information does not fit on the screen. Use the cursor up/down to browse through all the information.

❷ Press the yellow colour key again to switch off the information.

Acquisition and updating of NEXTVIEW information

Acquisition and updating of NEXTVIEW is done when you are watching a TV channel supporting NEXTVIEW.

Video recorder restrictions with NEXTVIEW

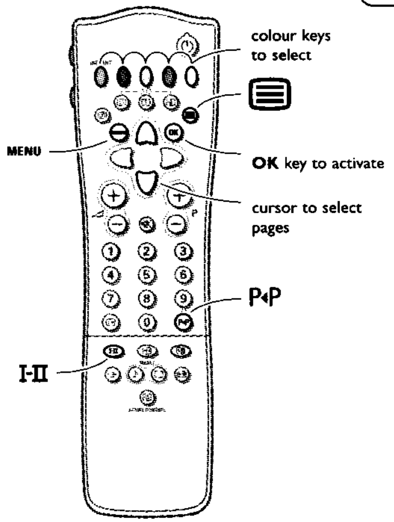
The **Record** item and the automatic recording will only be present and possible if your video recorder is equipped with NEXTVIEWLink.
Your video recorder should be connected to **EXTERNAL 2**. See Connect Peripheral Equipment, p. 19.

The daily, weekly and series options, the number of recordings set and the way overlapping recordings are managed, depend on the type of video recorder you have. When all video recorder timers are full, the item **Record** in the menu will not be present.

Upload video recorder overview *(only with Philips sets)*
When the TV is switched on, the timer recordings are uploaded to the TV to check if any manual addition or deletions have been done. This is shown in the overview.
The video recorder manages and removes timer recordings when performed.

Some NEXTVIEWLink video recorders do not allow a daily programming of the recording to start on a Saturday or Sunday. In this case the item **daily** will be removed from the menu on those days.

Teletext



Most TV channels broadcast information via teletext.
Each channel which broadcasts teletext transmits a page with information on how to use its teletext system. Look for the teletext page with the main index (usually p. 100).
Depending on the TV channel, teletext is transmitted in different systems.
The colours used in the options line correspond with the colour keys of your remote control.

About Easy Text

Easy Text considerably reduces the waiting time (on condition that the teletext broadcast of the particular TV channel is received for at least half a minute) by :

- a direct selection of previous and following pages which are in transmission and of the pages referred to in the options line
- a habit watcher list: frequently used pages are put automatically in a list of preferred pages, so that they are immediately available
- the precapturing of the page numbers referred to in the displayed page
- the precapturing of all the subpages.

Switch Teletext on and off

Press ≡ to switch the teletext on or off.
The main index page appears on the screen together with two information lines at the top and one option line at the bottom of the screen.

Remark: if the displayed teletext characters on screen do not correspond with the characters used in your language, press the **I-II** *key repeatedly to select Language group 1 or 2.*

Select a Teletext page

With the digit keys
Enter the desired page number with the digit keys.
The page counter seeks the page or the page appears immediately when the page number has been stored in the memory.
A message appears when you have entered a non existent or incorrect page number. Page numbers beginning with 0 or 9 do not exist. Choose another number.

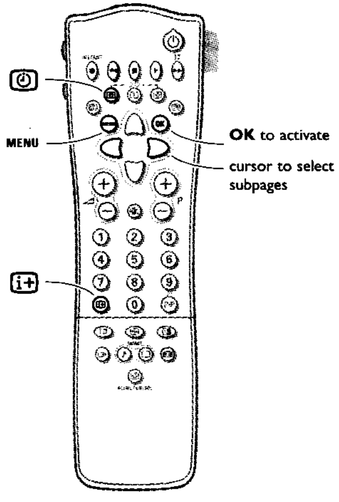
With the option line
Select with the colour keys, corresponding to the coloured options at the bottom of the screen, the desired subject.

Quickly run through the teletext pages

Press the cursor up/down or the **- P +** key to run through the previous or the following pages.

Select the previously selected txt page

Press the P‹P key.



Select the index teletext page

Press the white colour key to display the main index (usually p.100).

Only for T.O.P teletext broadcasts :
T.O.P orders the pages in categories and adds other possibilities of enhancing ease of use.
Press i+. A T.O.P. overview of the teletext subjects available is displayed.
Not all TV channels broadcast T.O.P. teletext. When the teletext system is not T.O.P. teletext, a message appears at the top of the screen.
Select with the cursor up/down, left/right the desired subject and press the **OK** key.

Select subpages

When a selected teletext page consists of different subpages, one of the subpages appears on the screen.
The coloured number in the first information line refers to the displayed subpage.
The other subpages can be selected in 2 ways :

With the cursor left/right
The other subpage numbers appear in white as soon as the transmission has found them. They are stored in the memory so that they are available while the teletext page is on screen.
Select with the cursor left/right the previous or the following subpage.

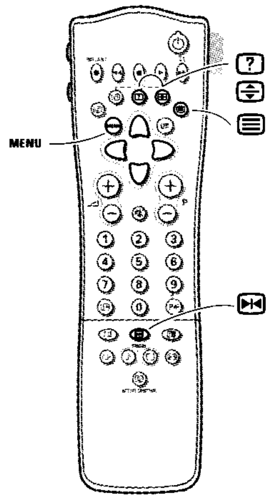
With the ◎ key
- Enter the subpage number yourself:

Press ◎. Enter the desired subpage with the digit keys : e.g. 3 for the third page of seven subpages.
The TV searches for the selected subpage.

- Automatically rotating subpages:

Press ◎ again to cancel the entered digit key for the subpage.
Now the subpages rotate automatically.

Press ◎ again to select the subpages with the cursor left/right again.



Special teletext functions

Hold
Press ▶◀ to stop the automatically rotating of the subpages or to stop the page counter from seeking when you have entered a wrong page number or when the page is not available.
Enter another page number.

Enlarge
Press ⇳ repeatedly to display the upper part, the lower part and then to return to the normal page size. When the upper part is displayed, you can scroll the text, line by line using the cursor up/down.

Reveal
Press ? to reveal/conceal the hidden information, such as solutions to riddles and puzzles.

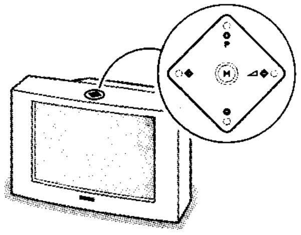
Select Continuous Subtitles

TV channels with teletext often transmit programmes with subtitling. For each TV channel you can store a subtitle page which will be displayed continuously if the programme being broadcast is transmitted with subtitles.

Switch on teletext and select the proper subtitle page from the index.
Switch off teletext.
Now the subtitle page is stored for the selected TV channel.

Once subtitles have been stored and **Subtitle On** has been selected they will automatically be displayed on the selected TV channel if subtitles are in the transmission.
Select **Subtitle On** or **Off** in the Features menu, see p. 11.
The subtitle symbol ▭ appears when **Subtitle On** is selected.

Remark: you are in teletext mode, so only teletext functions are available.



Keys on top of the TV

Should your remote control be lost or broken you can still change some of the basic picture settings with the keys on top of the TV.

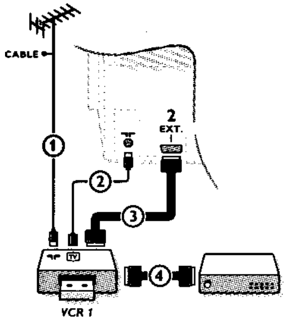
Press the **M** key repeatedly to select **Volume**, **Brightness**, **Colour**, **Contrast**.
Press the **P** - or + keys to carry out the selected adjustment.
When the menu adjustment is not displayed, the **P**- or + keys enable you to select the TV channels, the ◿ - or + keys to adjust the volume.

The selected adjustment automatically switches off when no action has been executed for 10 seconds.

Connect Peripheral Equipment

There is a wide range of audio and video equipment that can be connected to your TV. The following connection diagrams show you how to connect them.

Video recorder



Connect the aerial cables ①, ② and, to obtain the optimum picture quality, eurocable ③ as shown opposite.

If your video recorder is provided with the EasyLink function, the eurocable supplied with it should be connected to ***EXTERNAL 2*** *to benefit from the EasyLink functionality.*

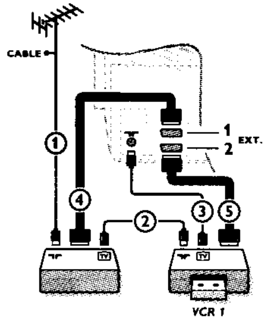
If the eurocable ③ is not used the following steps are required:

Search for and store the test signal of the video recorder

1. Unplug the aerial cable ① from the aerial socket ⊤ of your video recorder.
2. Switch on your TV and put the video recorder on the test signal. (See the handbook for your video recorder.)
3. Search for the test signal of your video recorder in the same way as you searched for and stored the TV signals. See Installation, Searching for and storing TV channels, Manual installation, p. 5.
4. Store the test signal under programme number 0 or between 90 and 99.
5. Replace the aerial cable in the aerial socket ⊤ of your video recorder after you have stored the test signal.

Decoder and video recorder
Connect a eurocable ④ to your decoder and to the special euroconnector of your video recorder. See also the video recorder handbook.
See Define Decoder/Descrambler prog. numbers, p. 7.
You can also connect your decoder directly to **EXTERNAL 1** or **2** with a eurocable.

Video recorder and other peripherals (except Digital Sources)

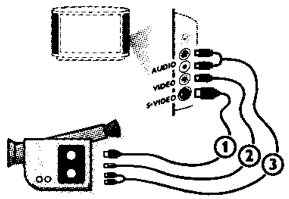


1. Connect the aerial cables ①, ② and ③ as shown opposite. Better picture quality can be obtained if you also connect eurocable ⑤ to **EXTERNAL 2** and a eurocable ④ to **EXTERNAL 1**.
2. Look for the test signal of your peripheral in the same way as you do for a video recorder.

When a video recorder is connected to ***EXTERNAL 1*** *you can only record a programme from your TV.*
Only when a video recorder is connected to ***EXTERNAL 2*** *it is possible to record a programme from your TV as well as from other connected equipment. See Record with your video recorder, p. 24.*

Note: EXTERNAL 1 can handle CVBS and RGB, EXTERNAL 2 CVBS and Y/C.

Camera & camcorder

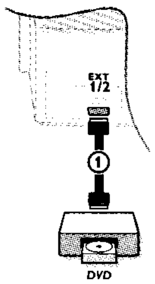


1. Connect your camera or camcorder to sockets at the right side of your TV.
2. Connect the equipment to **VIDEO** ② and **AUDIO L** ③ for mono equipment.

   Press the I-II key repeatedly to select the sound coming from one or both loudspeakers of your TV.
3. For stereo equipment also connect **AUDIO R** ③.

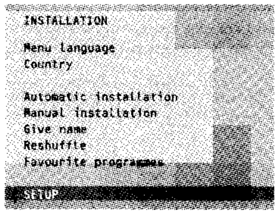
S-VHS quality with an S-VHS camcorder is obtained by connecting the S-VHS cables with the **S-VIDEO** input ① and **AUDIO** inputs ③.

Digital equipment (DVD, digital satellite tuner,...)

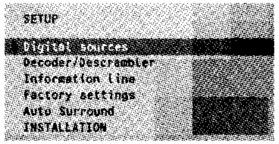


Connect your digital equipment with a eurocable ① to one of the euroconnectors (**EXT1** or **EXT2**), or with a cinch cable to the **VIDEO** input at the right side of the TV (see illustration above).

1. Press ⊚ and ⊕ at the same time.



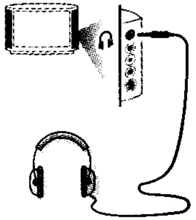
INSTALLATION
Menu language
Country
Automatic installation
Manual installation
Give name
Reshuffle
Favourite programmes
SETUP



SETUP
Digital sources
Decoder/Descrambler
Information line
Factory settings
Auto Surround
INSTALLATION

2. Select **Digital sources** in the Setup menu of the **INSTALLATION** menu and select:
   - **None** if you have no digital source connected,
   - **EXT1** or **EXT2** if you have connected your equipment to a euroconnector,
   - **FRONT** in case you have connected your equipment to the right side of the TV.
3. **Press the MENU key to switch off all menus.**

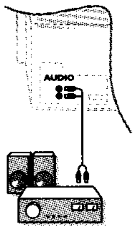
Note: the low quality of some digital picture material may be the cause of digital image distortion. In this case select ***Eco*** *under the* ***SMART PICTURE*** ☐ *key on the remote control as this setting is intended to improve distorted picture quality.*



Headphone

1. Insert the plug into the headphone socket 🎧 at the right side of the TV.
2. Press 🔇 on the remote control to switch off the internal loudspeakers of the TV.
   The headphone impedance must be between 8 and 4000 Ohm.
   The headphone socket has a 3.5 mm jack.

In the **SOUND** menu select **Headphone volume** to adjust the headphone volume, see p. 10.

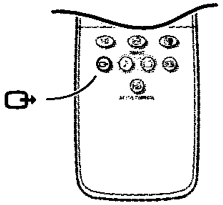


Audio equipment / Amplifier

Connect the audio cables to the audio input of your audio equipment and to **AUDIO L** and **R** at the back of your TV.

You can listen to your TV sound via your audio equipment.

If you want to connect more equipment to your TV, consult your dealer.



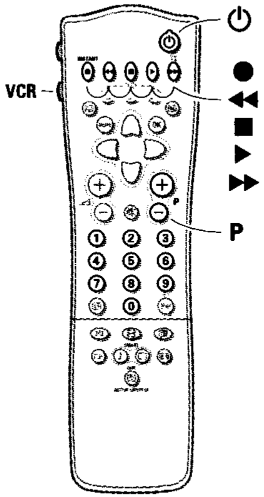
To select connected equipment

If the TV is connected to a video recorder with the EasyLink function, in some cases the TV will be switched on, even when it was in standby. (E.g. playback tape,...)
This is not possible when Child lock On is selected.

Equipment connected with an aerial cable only :
Select the programme number under which you have stored the test signal with the digit keys.

Equipment connected to a euroconnector or to the right side of the TV
Press the ⮊ key repeatedly to select **EXT1**, **EXT2** or **FRONT**, according to where you connected your equipment at the back or the right side of your TV.
Remark : Most equipment (decoder, video recorder, satellite receiver) carries out the switching itself.

If you want to change to TV channels?
Enter the programme number of the TV channel which you want to watch with the digit keys or press the ⮊ key repeatedly to select **TV**.



Audio and video equipment keys

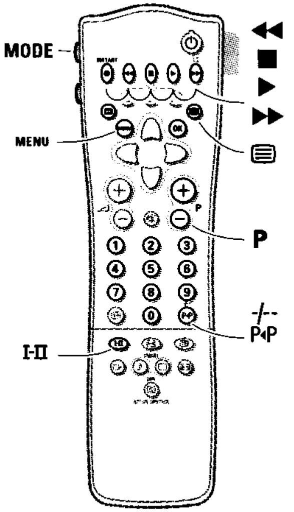
Most of the audio and video equipment from our range of products can be operated with the remote control of your TV.

Video recorder
Keep the **VCR** key on the left side of the remote control pressed and simultaneously press:

●	for record,
◀◀	for rewind,
■	for stop,
▶	for play,
▶▶	for fast forward,
-/--	for selecting 1- or 2-digit programme numbers from the video recorder,
- P +	for sequential programme selection from the video recorder tuner,
0 to 9	to select a programme number from your video recorder tuner,
⏻	to switch the video recorder to standby

These keys function with equipment which use the RC5 signalling standard.

If your video recorder has the EasyLink function, the key **INSTANT** ● *for recording, can be operated in the TV mode.*
If your EasyLink video recorder has the system standby function, when you press the ⏻ *key for 3 seconds, both TV and the video recorder are switched to standby.*



Satellite receiver

Press the **OK** key simultaneously with the digit key 1.
Now you can operate your satellite receiver with the remote control of your TV.

Keep the **MODE** key on the left side of the remote control pressed and simultaneously press:

MENU	to switch the **SAT** menu on or off
-/--	to select a one or two digit programme number from the satellite receiver.

These keys function with equipment which use the RC5 signalling standard.

DVD player

Press the **OK** simultaneously with the digit key 2.
Now you can operate your DVD player with the remote control of your TV.

Keep the **MODE key** on the left side of the remote control pressed and simultaneously press:

MENU	to switch the DVD menu on or off
▤	to select a DVD title
P◂P	to select a DVD chapter
I-II	to select your choice of audio language
◀◀	to search down
■	stop
▶	play
▶▶	to search forward
0-9	to select a programme number from your DVD
OK	to enter the selected menu item

●, ⏻, ?, ⊕, ⇥ have no function

Note: after replacing the batteries the default operational equipment is the satellite receiver.

These keys function with equipment which use the RC6 signalling standard.

Record with your video recorder

To record S-VHS quality, connect an S-VHS peripheral directly to the video recorder.

Record a TV programme

❶ Select the programme number on your video recorder.
❷ Set your video recorder to record.
See the handbook for your video recorder.

Switching programme numbers on your TV does not disturb recording !

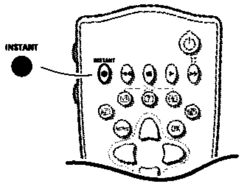
Record a programme on your video recorder connected to EXTERNAL 2 from Audio/Video equipment connected to EXTERNAL 1 or to sockets on the right side of the TV

❶ Switch on the equipment.
❷ Select the right external on your video recorder.
❸ Set your video recorder to record.
You record what you are watching on the screen.

Do not switch programme numbers or do not switch off your TV when you are recording !

Record with your video recorder with EasyLink

If you have connected an S-VHS video recorder provided with the EasyLink function, you can record S-VHS-quality from an S-VHS peripheral connected to the right side of the TV. (E.g. from an S-VHS camcorder.)



In TV mode, it is possible to start a direct recording of the programme which is being displayed on the TV screen.
*Press the **INSTANT** ● record key of the remote control.*
The video recorder switches on from standby and a message of what is being recorded appears on the screen.
The video recorder starts recording the programme you are watching.
Switching programme numbers on your TV does not disturb recording !

When recording a programme from a peripheral connected to EXTERNAL 1 or FRONT, you can not select another TV programme on the screen.
To watch TV programmes again, press the programme number you want to select twice.
Attention: the recording is stopped and your video recorder switches to standby.

Record with your video recorder with NEXTVIEWLink

If your video recorder is equipped with NEXTVIEWLink and you tagged one or more programmes to be recorded automatically in the NEXTVIEW mode, it is not necessary for the TV to be in the standby mode or switched on for the recording to start.

4. Mechanical instructions

4.1 Accessing the service connector (for ComPair)

1. Remove the 'Service Connector' cover, see Figure 4.1.
2. Connect the ComPair cable (for more info see chapter 5).
3. Start ComPair and perform the diagnosis.

4.2 Removing the Rear Cover

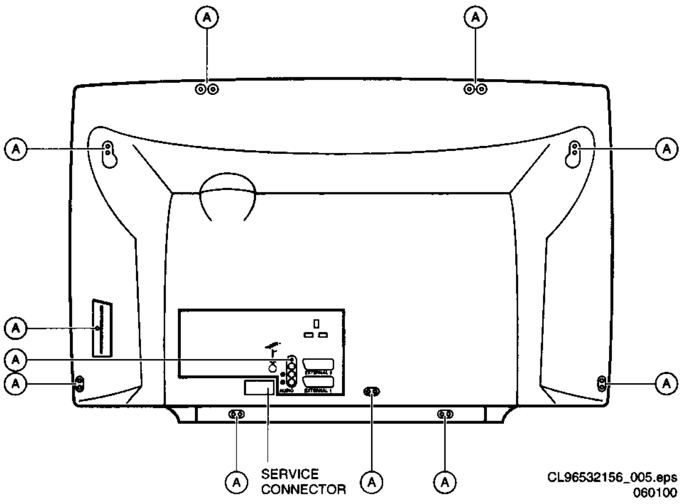

A
A
A
A
A
A
A
A
A
SERVICE CONNECTOR
A
A
CL96532156_005.eps
060100

Figure 4-1

1. Remove the fixation screws (A) of the rear cover, notice also the screw for the side-I/O.
2. Now the rear cover can be removed.

4.3 Service position

The following PWB's are present in this chassis (see also 'Chassis overview', chapter 1):

1. Large Signal Panel (LSP)
2. Small Signal Board (SSB)
3. Top Control panel
4. CRT panel (or PTP)
5. Side I/O panel
6. Mains Switch/LED panel

4.3.1 Service position LSP

Position 1: For better accessibility of the LSP, do the following (figure 4.2):

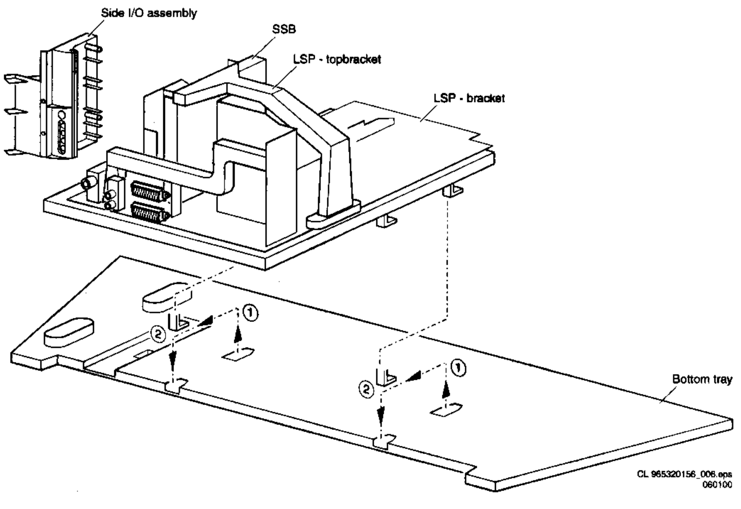

Side I/O assembly
SSB
LSP - topbracket
LSP - bracket
①
②
①
②
Bottom tray
CL 965320156_006.eps
060100

Figure 4-2

1. Remove the LSP-bracket from the bottom tray by pulling it backwards.
2. Hook the bracket in the first row of fixation holes of the bottom tray. In other words reposition the bracket from (1) to (2).

Position 2: To get access to the bottom side (solder side) of the LSP, do the following (figure 4.3):

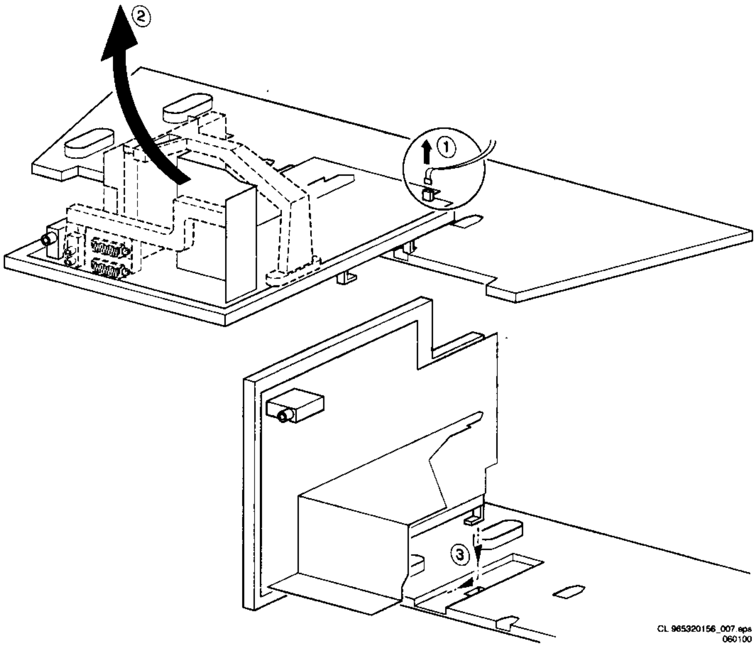

②
①
③
CL 965320156_007.eps
060100

Figure 4-3

1. Disconnect the degaussing coil from the LSP by removing the cable on connector 0020 (1).
2. Release the wiring from the heatsink fixation clamps, in order to get room for repositioning the LSP.
3. Turn the LSP 90 degrees clockwise (2) and place it in the fixation hole at the left side of the bottom tray (3).

4.3.2 Service position SSB

In fact there is no predefined service position for the bottom (B-) side of the SSB. All relevant test points are located on the A-side (side that is facing the Tuner).
If IC's must be replaced: take the complete panel out of the SIMM-connector.
To get access to the SSB test points, do the following:

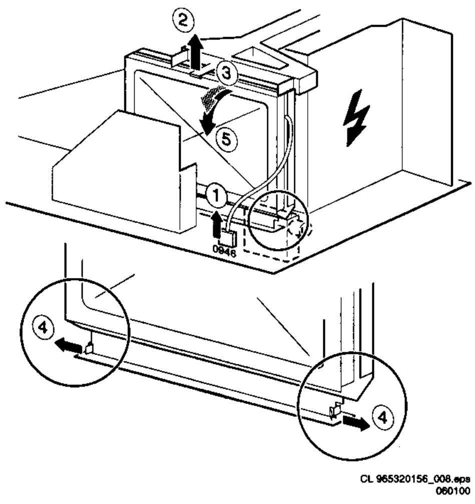

②
③
⑤
①
0946
④
④
CL 965320156_008.eps
060100

Figure 4-4

1. Put the LSP in service position 1 (as described above).
2. Disconnect the IF-cable from connector 0946 (1).
3. Release the 'top fixation clamp' which holds the SSB (2) and pull the SSB slightly towards the Tuner (3). At the same time, the 2 metal clamps at both sides of the SIMM-connector must be released (4) and the complete SSB can be taken out now by pulling the top-side of the SSB towards the Tuner (5). It 'hinges' in the SIM-connector.

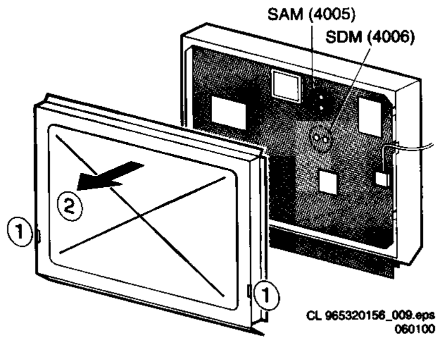


Figure 4-5

1. Once the SSB has been taken out of the connector, the A-side shielding can be removed.
2. After removal of the shielding, the panel can be replaced in its connector in reverse order. Don't forget to reconnect the IF-cable.
3. If necessary for the measurement, the LSP can be put in 'service position 2' (as described above).

4.3.3 Accessing the Top Control panel

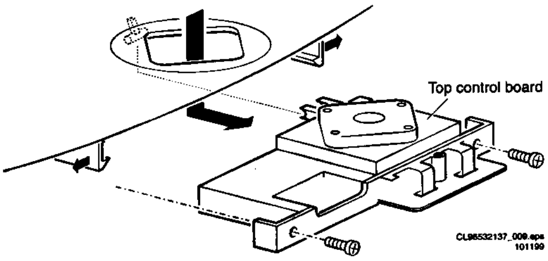


Figure 4-6

1. Remove the two screws.
2. Pull the board backward.

4.3.4 Accessing the Side I/O panel

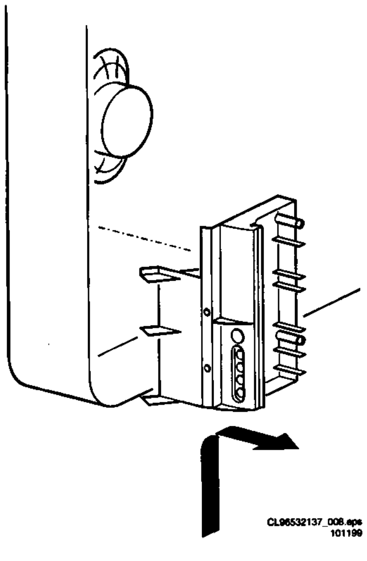


Figure 4-7

1. The complete Side I/O-assembly can be lifted out of the hinge for servicing.
2. The board can easily be removed out of the bracket by releasing the fixation clamps.

4.3.5 Accessing the Mains Switch/LED panel

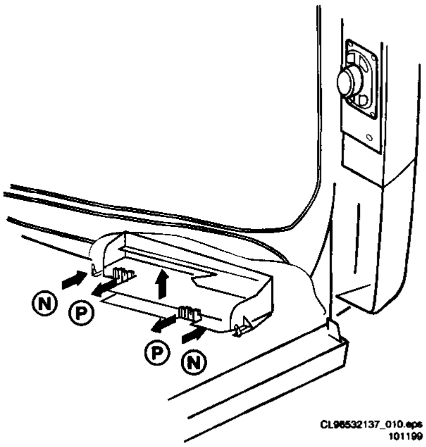


Figure 4-8

1. Release the two fixation clamps (N) by pushing them upward.
2. At the same time, the complete assy must be pulled backward (P).
3. If necessary, the light guide can be replaced now.
4. The 'Mains Switch/LED'-panel can be removed now by releasing the clamps of the bracket.

4.4 Mounting the Rear Cover

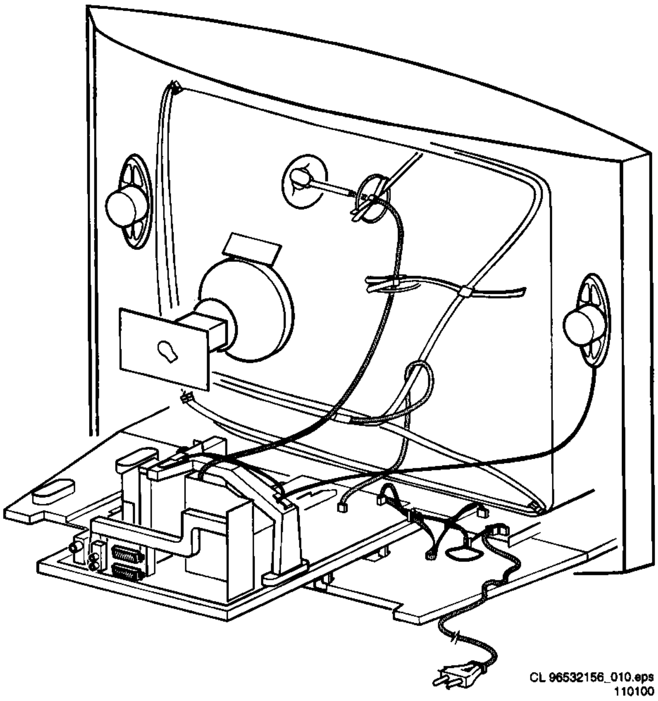


Figure 4-9

Before mounting the Rear Cover, some checks has to be performed:

- Check whether the Mains Cord is mounted correctly in the guiding brackets.
- Check whether all cables are replaced in their original position. This is very important due to the large 'hot' area of the set. Special attention must be paid to the right Loudspeaker cable and the degaussing cable.

5. Service modes, error codes, protections, faultfinding and repair tips

In this chapter the following paragraphs are included:

1. Test points.
2. Service modes.
3. Problems and solving tips (related to CSM).
4. ComPair.
5. Error codes.
6. Protections.
7. Repair tips.

5.1 Test points

The EM2E chassis is equipped with test points in the service printing. These test points are referring to the functional blocks:

- P1-P2-P3, etc. on LSP: Test points for the power supply.
- L1-L2-L3, etc. on LSP: Test points for the line drive and line output circuitry.
- F1-F2-F3, etc. on LSP: Test points for the frame output circuitry.
- R1-R2 on LSP: Test points for the rotation circuitry.
- A1-A2-A3, etc.: Test points for the audio circuitry.
- I1-I2-I3, etc. on SSB:Test points for the Tuner/IF part.
- S1-S2-S3, etc. on SSB: Test points for the synchronisation circuitry.
- V1-V2-V3, etc. on SSB: Test points for the video processing circuitry.
- C1-C2-C3, etc. on SSB: Test points for the control and teletext circuitry.
- F1F-F2F-F3F, etc.: Test points for the CRT-panel circuitry.
- SC1-SC2-SC3, etc: Test points for the SCAVEM circuitry.

The numbering is done in a for diagnostics logical sequence; always start diagnosing within a functional block in the sequence of the relevant test points for that functional block.

5.2 Service modes and ComPair

5.2.1 Service Default Mode (SDM)

The purpose of the SDM is to provide a situation with predefined settings to get the same measurement results as given in this manual.

Specification of the SDM:

- Tuning frequency 475.25 MHz.
- TV-system for BGLM sets set to BG.
- All picture settings at 50 % (brightness, colour, contrast, hue).
- All sound settings at 50 % except volume at 25 % (so bass, treble, balance at 50 %, volume at 25 %).
- All service-unfriendly modes are disabled (like sleep timer, child lock, blue mute, AVL and SDLP).

Entering the SDM can be done in 4 ways:

- Via a standard RC-handset by entering the code '062596' followed by the 'MENU' button (it is possible that, together with the SDM, the main menu will appear. To switch it off, push the 'MENU' button again).
- Via ComPair.
- By the 'DEFAULT' button on the DST while the set is in the normal operation mode.
- By short-circuiting for a moment the two solder-pads with the indication 'SDM' (item 4006) on the A-side of the SSB (activation can be performed in all modes except when the set has a problem with the main-processor).

Note: If the SDM is entered via the pins, all the software-controlled protections are de-activated.

Exiting the SDM can only be done via the STANDBY command. By switching off-on the set with the mains switch the set will come up again in the SDM.

5.2.2 Service Alignment Mode (SAM)

The purpose of the SAM is to align the set and/or adjust the settings.

Specification of the SAM:

- Software alignments (see chapter 8).
- Option settings (see chapter 8).
- Error buffer reading and erasing. The most recent error code is displayed on the left side.
- Operation counter.
- Software version.

Entering the SAM can be done in 4 ways:

- Via a standard RC-handset by entering the code '062596' followed by the 'OSD' button [i +] (it is possible that, due to the button sequence, the channel will change to channel 9. To return to the channel of your selection, push the appropriate button on the RC).
- Via ComPair.
- By the 'ALIGN' button on the DST while the set is in the normal operation mode (or SDM). Enter the password '3140' and press OK.
- By short-circuiting for a moment the two solder-pads with the indication 'SAM' (item 4005) on the A-side of the SSB (activation can be performed in all modes except when the set has a problem with the main-processor).

Note: If the SAM is entered via the pins, all the software controlled protections are de-activated.

The Service Alignment Mode menu will now appear on the screen. The following information is displayed:

- Date: the software date.
- ID: the software version of the ROM (Example: EM2E11.0_01501. This software-code stands for EM2E (chassis), E = Europe, 1 = language, 1.0 = software version, xxxxx = latest 5 digits of 12nc code software).
- Operation Hours: the accumulated total of operation hours.
- Errors: followed by maximal 10 errors. The most recent error is displayed at the upper left. For explanation errors see (table 5.1).
- Defect. Module: here the module that generates the error is displayed. If there are multiple errors in the buffer that have not all been generated by a single module, there is probably another defect. The message 'Unknown' will then be displayed here.
- Reset Error Buffer: pressing the 'OK' key can reset the error buffer.
- Functional Test: all devices are tested via the 'OK' key. Eventual errors are displayed in the error buffer. The error buffer is not erased, the content returns when the Functional Test is terminated.
- Alignments: this enables the Alignments sub-menu to be called up.
- Dealer Options: extra features for dealers.

Exiting the SAM can be done via the 'MENU' command or via switching OFF-ON the set with the mains switch.

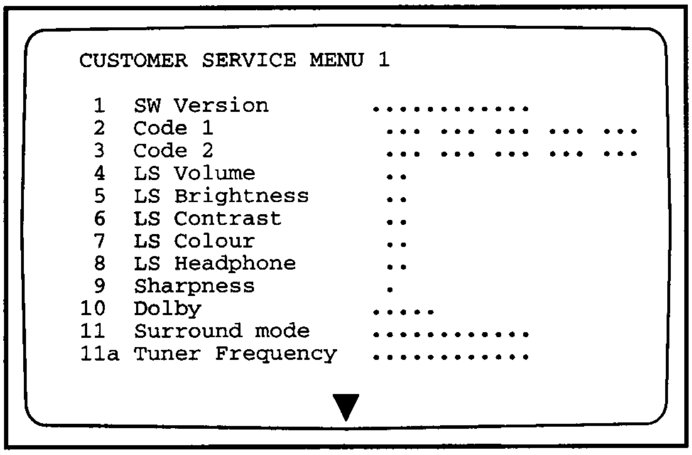
5.2.3 Customer Service Mode (CSM)

All EM2E sets are equipped with the 'Customer Service Mode' (CSM). This 'Customer Service Mode' is a special service mode, which can be activated and deactivated by the customer upon request of the service technician/dealer during a telephone conversation in order to identify the status of the set. This CSM is a 'read only' mode, therefore modifications in this mode are not possible.

Switching-on of the Customer Service Mode:
The Customer Service Mode will switch-on after pressing simultaneously the 'MUTE' knob on the remote control handset and the 'MENU' button on the TV for at least 4 seconds. This activation only works if there is no menu on the screen.

Switching-off the Customer Service Mode:
The Customer Service Mode will switch-off after pressing any key of the remote control handset (with exception of the 'cursor-up' and 'cursor-down' keys), or the buttons on the TV or by switching off the TV set with the mains switch.

Detailed explanation of the Customer Service Mode
After switching on the Customer Service Menu the following screen will appear:



```
CUSTOMER SERVICE MENU 1

 1  SW Version        ............
 2  Code 1             ... ... ... ... ...
 3  Code 2             ... ... ... ... ...
 4  LS Volume         ..
 5  LS Brightness     ..
 6  LS Contrast       ..
 7  LS Colour         ..
 8  LS Headphone      ..
 9  Sharpness         .
10  Dolby             .....
11  Surround mode     ............
11a Tuner Frequency   ............

                ▼
```

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Figure 5-1

Note: Following text is an explanation of the CSM. Be aware that these descriptions are depending on the set hardware.

Line 1:
Software version; the build in software version (AAABCX.Y)
- AAA = chassis name (EM1 = Painter processor, EM2 = OTC processor)
- B = country (E = Europe, A = Asian Pacific, U = USA)
- C = 1 (language cluster)
- X = main version number
- Y = sub version number

Details on the software version can be found in the chapter 'Software Survey' of the publication 'Product Survey - Colour Television'.

Line 2:
Code 1; gives the last 5 errors of the error buffer. As soon as the built-in diagnose software has detected an error the buffer is adapted.

Line 3:
Code 2; gives the first 5 errors of the error buffer. As soon as the built-in diagnose software has detected an error the buffer is adapted.
The last occurred error is displayed on the leftmost position of code 2. Each error code is displayed as a 3 digit number. When less than 10 errors occur, the rest of the line(s) is (are) empty. In case of no errors the text 'No Errors' is displayed. See paragraph 5.5 of this chapter for a description of the error codes.

Line 4:
LS Volume; gives the Last Status of the volume as set by the customer for this selected transmitter. The value can vary from 0 (volume is minimum) to 24 (volume is maximum). Volume values can be changed via the volume key on the remote control handset.

Line 5:
LS Brightness; gives the Last Status of the brightness as set by the customer for this selected transmitter. The value can vary from 0 (brightness is minimum) to 63 (brightness is maximum). Brightness values can be changed via the 'cursor left' and 'cursor right' keys on the remote control handset after pressing the 'MENU' button and selecting 'PICTURE' and 'Brightness'.

Line 6:
LS Contrast; gives the Last Status of the contrast as set by the customer. The value can vary from 0 (contrast is minimum) to 63 (contrast is maximum). Contrast values can be changed via 'cursor left' and 'cursor right' keys on the remote control handset after pressing the 'MENU' button and selecting 'PICTURE' and 'Contrast'.

Line 7:
LS Colour; gives the Last Status of the colour saturation, as set by the customer. The value can vary from 0 (colour is minimum) to 63 (colour is maximum). Colour values can be changed via 'cursor left' and 'cursor right' keys on the remote control handset after pressing the 'MENU' button and selecting 'PICTURE' and 'Colour'.

Line 8:
LS Headphone; gives the Last Status of the headphone volume, as set by the customer. The value can vary from 0 (volume is minimum) to 24 (volume is maximum). Headphone volume values can be changed via the 'cursor left' and 'cursor right' keys on the remote control handset after pressing the 'MENU' button and selecting 'SOUND' and 'Headphone'.

Line 9:
Sharpness; gives the sharpness value. The value can vary from 0 (sharpness is minimum) to 7 (sharpness is maximum). In case of bad antenna signals a too high value of the sharpness can result in a noisy picture. Sharpness values can be changed via the 'cursor left' and 'cursor right' keys on the remote control handset after pressing the 'MENU' button and selecting 'PICTURE' and 'Sharpness'.

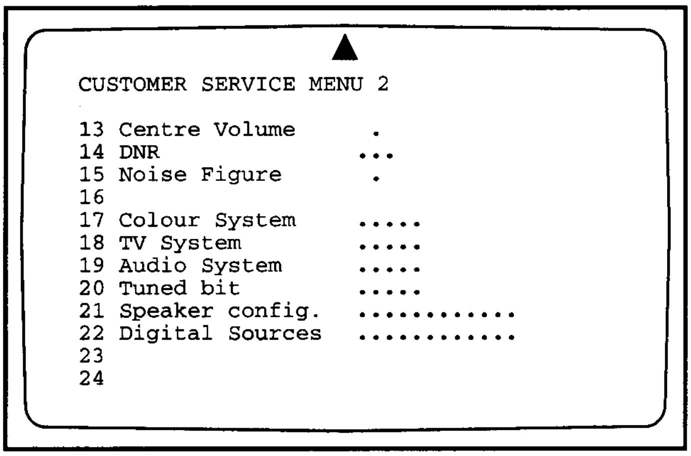
Line 10:
Dolby; indicates whether the received transmitter transmits Dolby sound (present) or not (not present). Attention: The presence of Dolby can only be tested by the software on the Dolby Signalling bit. If a Dolby transmission is therefore received without a Dolby Signalling bit, then this indicator will show 'not present' even though such a Dolby transmission is received.

Line 11:
Surround Mode; indicates the by the customer selected surround mode. In case the set is a Non-Dolby set there will be displayed '0'. If it is a Dolby-set then is displayed: 'Pro Logic', 'Dolby 3 Stereo', 'Hall' or 'Off'. For Dolby-set surround mode can be changed via the 'cursor left' and 'cursor right' keys on the remote control handset after pressing the 'MENU' button and selecting 'SOUND' and 'Surround settings'.

Line 11a:
Tuner Frequency; indicates the frequency the selected transmitter is tuned to. The tuner frequency can be changed via the “cursor left” and “cursor right” keys for fine tune or by entering directly with the digit keys 0 to 9 on the remote control

handset after opening the installation menu and selecting "manual installation".
The installation menu can be opened by pressing "timer" and "enlarge" at the same time.

By means of the 'cursor-down' knob on the remote control handset the Customer Service Menu 2 will appear. By means of the 'cursor-up' knob on the remote control handset the Customer Service Menu 1 will appear again.
Customer Service Menu 2 represents following information:



```
                         ▲
CUSTOMER SERVICE MENU 2

13 Centre Volume       .
14 DNR                ...
15 Noise Figure        .
16
17 Colour System      .....
18 TV System          .....
19 Audio System       .....
20 Tuned bit          .....
21 Speaker config.    ............
22 Digital Sources    ............
23
24
```

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Figure 5-2

Line 13:
Centre Volume; gives the volume value of the centre loudspeakers. This value can vary from 0 (minimum volume) to 63 (maximum volume). Centre volume can be changed via the 'cursor left' and 'cursor right' keys on the remote control handset after pressing the 'MENU' button and selecting 'SOUND', 'Dolby Pro Logic' and 'Centre volume'. This feature is only available when surround mode is in 'Dolby Pro Logic' or 'Dolby 3 Stereo'.

Line 14:
DNR; gives the setting of the DNR for the selected transmitter. The following selections are possible:
'off', 'min', 'med' or 'max'. The DNR is changed automatically when 'Active Control' is 'ON'.

Line 15:
Noise Figure; gives the noise ratio for the selected transmitter. This value can vary from 0 (good signal) to 127 (average signal) and to 255 (bad signal).

Line 16:
Digital Option; gives the selected digital mode, '100 Hz' or 'Digital Scan'. Digital option can be changed via the 'cursor left' and 'cursor right' keys on the remote control handset, after pressing the "MENU' button and selecting 'PICTURE', 'Digital Options'.

Line 17:
Colour System; gives information about the colour system of the selected transmitter.
- Black and white: No colour carrier received
- PAL: PAL signal received
- SECAM: SECAM signal received
- NTSC: NTSC signal received

Line 18:
TV System; gives information about the video system of the selected transmitter.
- BG: BG signal received
- DK: DK signal received
- I: PAL I signal received
- L: SECAM L signals received
- M38.9: NTSC M signal received with video carrier on 38.9 MHz
- MN: NTSC M signal received

Line 19:
Audio System; gives information about the audio system of the selected transmitter.
- Sound Muted: No sound
- Dolby Pro Logic: Dolby Pro Logic sound received
- Mono: Mono sound received
- Stereo: Stereo sound received
- Dual I: Language I received
- Dual II: Language II received
- Digital Mono: Digital mono sound is received
- Digital Stereo: Digital stereo sound is received
- Digital Dual I: Digital language I is received
- Digital Dual II: Digital language II is received

Line 20:
Tuned bit; gives information about the tuning method of the stored pre-set. If the value is 'Yes' the pre-set is stored via manual entry of the frequency when a transmitter was not present on that frequency. In that case the TV will attempt to perform a micro-search every time the pre-set number is selected. Once the micro-search has been successful the Tuned Bit will be set to 'No'.

Line 21:
Speaker config.; gives the configuration setting for the speakers. In case the set is a Non-Dolby set there will be displayed '0'. If it is a Dolby-set then is displayed: 'Full internal', 'L/R external', 'Surround external' or 'Full external'. For the Dolby-set the speaker configuration can be changed via the 'cursor left' and 'cursor right' keys on the remote control handset after opening the installation menu and selecting 'SETUP'. The installation menu can be opened by pressing 'timer' and 'enlarge' at the same time. This feature is only available when the set has virtual Dolby.

Line 22:
Digital Sources; gives the configuration setting for the digital source. This can be 'FRONT', 'EXT1', 'EXT2' or 'None'. If one of these is selected the starting point is a top quality signal on that input and a number of settings are therefore changed automatically. The digital source can be changed via the 'cursor left' and 'cursor right' keys on the remote control handset after opening the installation menu and selecting 'SETUP'. The installation menu can be opened by pressing 'timer' and 'enlarge' at the same time.

5.3 Problems and solving tips

Below described problems are all related to TV-settings. The procedures to change the value or the status of the different settings are described in the paragraph 'Detailed explanation of the Customer Service Mode'.

5.3.1 Picture problems

Worse picture quality in case of DVD pictures
Check line 22 'Digital sources'. In case line 22 gives the indication 'Not Present' change the setting into 'Present'.

Snowy/noisy picture
1. Check line 15 'Noise Figure'. In case the value is 127 or higher and the value is also high on other programs check the aerial cable/aerial system.

2. Check lines 9 'Sharpness' and 15 'Noise Figure'. In case the value of line 9 is 3 or 4 and the value of line 15 is high (127 or higher), lower the value of line 9 'sharpness'.

Picture too dark

1. Press 'Smart Picture' button on the Remote Control handset. In case picture improves, raise the brightness value or raise the contrast value. The new value(s) are automatically stored for all TV channels.
2. After switching on the Customer Service Mode the picture is OK. Raise the brightness value or raise the contrast value. The new value(s) are automatically stored for all TV channels.
3. Check lines 6 'LS Brightness' and 7 'LS Contrast'. The value of line 6 is low (<10) or the value of line 7 is low ((10). Raise the brightness value or raise the contrast value.

Picture too bright

1. Press 'Smart Picture' button on the Remote Control handset. In case picture improves, reduce the brightness value or reduce the contrast value. The new value(s) are automatically stored for all TV channels.
2. After switching on the Customer Service Mode the picture is OK. Reduce the brightness value or reduce the contrast value. The new value(s) are automatically stored for all TV channels.
3. Check lines 6 'LS Brightness' and 7 'LS Contrast'. The value of line 6 is high (>40) or the value of line 7 is high ((50). Reduce the brightness value or raise the contrast value.

White line around picture elements and text

1. Press 'Smart Picture' button on the Remote Control. In case picture improves, reduce the sharpness value. The new value(s) are automatically stored for all TV channels.
2. After switching on the Customer Service Mode the picture is OK. Reduce the sharpness value. The new value(s) are automatically stored for all TV channels.
3. Check line 8 'Sharpness'. Reduce the sharpness value. The new value(s) are automatically stored for all TV channels.

No picture

Check line 20 'Tuned bit'. In case the value is 'Yes', install the required program again: open the installation menu by pressing 'timer' and 'enlarge' at the same time and perform manual installation.

Blue picture

No proper signal is received. Check the aerial cable/aerial system.

Blue picture and/or unstable picture

A scrambled or decoded signal is received.

Black and white picture

Check line 5 'LS colour'. In case the value is low ((10) raise the value of colour. The new value(s) are automatically stored for all TV channels.

No colours/colour lines around picture elements

1. Check lines 17 'Colour System' and 18 'TV System'. In case line 17 is 'PAL' and line 18 is 'M38.9', the installed system for this pre-set is 'USA', while 'West Europe' is required. Install the required program again: open the installation menu by pressing 'timer' and 'enlarge' at the same time and perform manual installation. Select 'System; West Europe'.
2. In case line 17 is 'PAL' and line 18 is 'L', the installed system for this pre-set is 'France', while 'West Europe' is required. Install the required program again: open the installation menu by pressing 'timer' and 'enlarge' at the same time and perform manual installation. Select 'System; West Europe'.

No colours/noise in picture

1. Check lines 17 'Colour System' and 18 'TV System'. In case line 17 is 'Black and White' and line 18 is 'BG', the installed system for this pre-set is 'West Europe', while 'USA' is required. Install the required program again: open the installation menu by pressing 'timer' and 'enlarge' at the same time and perform manual installation. Select 'System; USA'.
2. In case line 17 is 'Black and White' and line 18 is 'L', the installed system for this pre-set is 'France', while 'USA' is required. Install the required program again: open the installation menu by pressing 'timer' and 'enlarge' at the same time and perform manual installation. Select 'System; USA'

Colours not correct

Check lines 17 'Colour System' and 18 'TV System'. In case line 17 is 'PAL' and line 18 is 'L', the installed system for this pre-set is 'France', while 'West Europe' is required. Install the required program again: open the installation menu by pressing 'timer' and 'enlarge' at the same time and perform manual installation. Select 'System; West Europe'.

Colours not correct/unstable picture

Check lines 17 'Colour System' and 18 'TV System'. In case line 17 is 'SECAM' and line 18 is 'BG', the installed system for this pre-set is 'USA', while 'France' is required. Install the required program again: open the installation menu by pressing 'timer' and 'enlarge' at the same time and perform manual installation. Select 'System; France'.

Unstable picture

Check lines 17 'Colour System' and 18 'TV System'. In case line 17 is 'SECAM' and line 18 is 'M 38,9', the installed system for this pre-set is 'West Europe', while 'France' is required. Install the required program again: open the installation menu by pressing 'timer' and 'enlarge' at the same time and perform manual installation. Select 'System; France'.

Menu text not sharp enough

1. Press 'Smart Picture' button on the Remote Control handset. In case picture improves, reduce the contrast value. The new value(s) are automatically stored for all TV channels.
2. After switching on the Customer Service Mode the picture is OK. Reduce the contrast value. The new value(s) are automatically stored for all TV channels.
3. Check line 7 'LS Contrast'. The value of line 7 is high (>50). Reduce the contrast value.

5.3.2 Sound problems

No sound from left and right speaker

1. Press 'Smart Sound' button on the Remote Control handset. In case sound improves, raise the volume value. The new value(s) are automatically stored for all TV channels.
2. After switching on the Customer Service Mode the volume is OK. Raise the volume value. The new value(s) are automatically stored for all TV channels.
3. Check line 4 'LS Volume'. The value is low. Raise the value of 'Volume'. The new value(s) are automatically stored for all TV channels.

Sound too loud for left and right speaker

1. Press 'Smart Sound' button on the Remote Control handset. In case sound improves, reduce the volume

value. The new value(s) are automatically stored for all TV channels.

2. After switching on the Customer Service Mode the volume is OK. Reduce the volume value. The new value(s) are automatically stored for all TV channels.
3. Check line 4 'LS Volume'. The value is high. Reduce the value of 'LS Volume'. The new value(s) are automatically stored for all TV channels.

5.4 ComPair

5.4.1 Introduction

ComPair (Computer Aided Repair) is a service tool for Philips Consumer Electronics products. ComPair is a further development on the DST service remote control allowing faster and more accurate diagnostics. ComPair has three big advantages:

- ComPair helps you to quickly get an understanding how to repair the EM2E in short time by guiding you step by step through the repair procedures.
- ComPair allows very detailed diagnostics (on I^2C level) and is therefore capable of accurately indicating problem areas. You do not have to know anything about I^2C commands yourself; ComPair takes care of this.
- ComPair speeds up the repair time since it can automatically communicate with the EM2E (when the micro processor is working) and all repair information is directly available. When ComPair is installed together with the SearchMan EM2E electronic manual, schematics and PWB's are only a mouse-click away.

ComPair consists of a Windows based fault finding program and an interface box between PC and the (defective) product. The ComPair interface box is connected to the PC via a serial or RS232 cable. In case of the EM2E chassis, the ComPair interface box and the television communicate with each other via a bi-directional service cable.

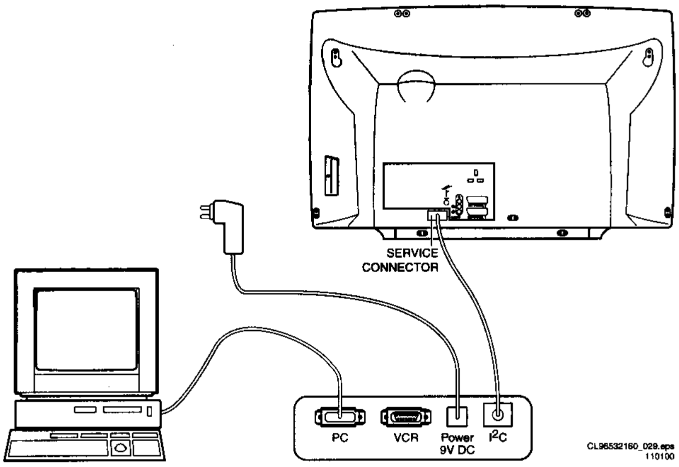

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Figure 5-3

The ComPair fault finding program is able to determine the problem of the defective television. ComPair can gather diagnostic information in 2 ways:

1. Communication to the television (automatic)
2. Asking questions to you (manually)

ComPair combines this information with the repair information in its database to find out how to repair the EM2E.

Automatic information gathering
Reading out the error buffer, ComPair can automatically read out the contents of the entire error buffer.
Diagnosis on I^2C level. ComPair can access the I^2C bus of the television without a physical connection. ComPair can send and receive infrared commands to the micro controller of the television. These commands are translated by the controller to I^2C commands and vice versa. In this way it is possible for ComPair to communicate (read and write) to devices on the I^2C busses of the EM2E.

Manual information gathering
Automatic diagnosis is only possible if the micro controller of the television is working correctly and only to a certain extend. When this is not the case, ComPair will guide you through the fault finding tree by asking you questions and showing you examples. You can answer by clicking on a link (e.g. text or an oscillogram) that will bring you to the next step in the faultfinding process.

A question could be: Does the screen give a picture? (Click on the correct answer) YES / NO
An example can be: Measure test point I7 and click on the correct oscillogram you see on the oscilloscope

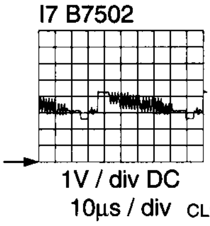

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Figure 5-4

By a combination of automatic diagnostics and an interactive question/answer procedure, ComPair will enable you to find most problems in a fast and effective way.

Additional features
Beside fault finding, ComPair provides some additional features like:

- Uploading/downloading of pre-sets
- Managing of pre-set lists
- Emulation of the Dealer Service Tool

5.4.2 SearchMan (electronic service manual)

When ComPair is installed in combination with SearchMan, all schematics and PWB's will be directly available while you repair a television if you click on a PWB or schematic link.
Example: Measure the DC voltage on C2568 (PWB/schematic) on the small signal level.
Clicking on PWB will automatically pop-up a picture of the PWB with the location of C2568 marked. Clicking on schematic will automatically pop-up the schematic with the location of C2568 marked.

5.4.3 Stepwise Start-up / Shutdown feature of set can be used via ComPair

Under normal circumstances, a fault in the power supply or an error during start-up will switch the television to protection-mode. ComPair can take over the initialisation of the television. In this way it is possible to distinguish which part of the start-up routine (hence which circuitry) is causing the problem.

Stepwise start-up explanation
Via ComPair the stepwise start-up can be realised. This is very helpful when a protection is activated (see also chapter 5.6).

State	Description mode	Display LED (Red)	Activate protection
0	Low Power Standby: 5V2/3V3 present, uP in Standby.	On	None
1	High Power Standby: TV-set in Standby.	Wait 1s, flash 1 time	None
2	Main Power On: 5V/ 8V present, HOP in Standby.	Wait 1s, flash 2 times	4, 5
3	HOP On: EHT startup, blackcurrent stabilisation off, picture blanked.	Wait 1s, flash 3 times	Plus 6, 2 & 1
4	Initialised. All IC's are initialised, blackcurrent stabilisation is on.	Wait 1s, flash 4 times	Plus rest
5	TV On: TV-set operates, unblanked picture.	Wait 1s, flash 5 times	

Stepwise shutdown explanation
In the stepwise shutdown mode, state 2 is skipped. (IC's can not be de-initialised).

State	Description mode	Display LED (Red)	De-activate protect.
5	TV On: TV-set operates, unblanked picture.	Wait 1s, flash 5 times	-
4	Initialised. All IC's stay initialised, blackcurrent stabilisation is on.	Wait 1s, flash 4 times	-
3	HOP On: EHT startup, blackcurrent stabilisation off, picture blanked.	Wait 1s, flash 3 time	6, 2, 1
1	High Power Standby: TV-set in Standby.	Wait 1s, flash 1 time	4, 5
0	Low Power Standby: 5V2/3V3 present, uP in Standby.	On	

Note: When set is in stepwise-mode and due to stepping-up a protection is activated, the set really will go into protection (blinking red led). The set will not leave the stepwise-mode however. By stepping up the set can be activated again, until state X, where protection was activated. At state (X-1) diagnostic measurements can be performed.

5.5 Error codes

5.5.1 Reading error codes from the error buffer

The error buffer can be read in 3 ways:

1. On the screen via the Service Alignment Mode (SAM). In case picture is OK, the error buffer can be read easiest via the SAM. In the main menu of the SAM the last 10 different error codes occurred are displayed. The most recent detected error code is displayed on the left side, so e.g.:
   - 0 0 0 0 0 means no error codes present in the buffer
   - 3 0 0 0 0 means one error code present in the buffer; error code 3
   - 2 3 0 0 0 means two error codes present in the buffer; error code 2 is the most recent, error code 3 is detected before 2.
2. Via the blinking LED procedure. The contents of the error buffer can also be made visible through the "blinking LED" procedure. This is especially useful when there is no picture. There are two methods:
   - When the SDM is entered, the LED will blink the number of times, equal to the value of the last (newest) error code (repeatedly).
   - Via the 'DIAGNOSE' key of the DST. If an error has been detected by the EM2E chassis, the set might go into protection. Without the presence of a picture, the errors can be displayed via the red LED on command of the DST, as long as the main-processor is still active. To display the errors via the red LED by the DST:
     1. Press the 'DIAGNOSE' key (in all modes except the SAM).
     2. Press '1' to view the last error detected (or '2', etc. to show the errors before).
     3. Press the 'OK' key. The blinking Red LED on the TV will now give the requested error.

     Example:
     Error code position 1 - 2 - 3 - 4 - 5
     Error buffer: 12 - 9 - 5 - 0 - 0

     After entering SDM: blink 1x long (750 ms for tens) - pause (1.5 s) - blink 8 x short (250 ms for units) - etc.
     After transmitting 'DIAGNOSE-2-OK' with the DST: blink 9 x short - pause (250 ms) - blink 9 x short - etc.
     After transmitting 'DIAGNOSE-3-OK' with the DST: blink 5 x short - pause (250 ms) - blink 5 x - etc.
     After transmitting 'DIAGNOSE-4-OK' with the DST: nothing happens
3. Via ComPair.

5.5.2 Clearing the error buffer

The error buffer can be cleared in 3 ways:

1. In the SAM by selecting the item 'RESET ERROR BUFFER' in the main menu.
2. By the 'DIAGNOSE 99' command of the DST (in all modes except the SAM). Press the DIAGNOSE key on the DST, followed by 9, 9 and then 'OK'.
3. Via ComPair.

Note: When error buffer is full (10 codes), no new error can be stored anymore. However of every error raised is monitored how long it exists in the error buffer. When for any reason a false raised error exists in the buffer, it will be deleted after 50 hours. If this error is still present after 50 hours, it will be raised again. In this way it is safeguarded that the error codes history is stored. Sometimes it is an option to first write down the error buffer content, reset the buffer, and look again which error codes are generated by the set.

5.5.3 Error code table

Error	Device	Description	Defective item	Diagram	Defect. module indication
1	ST24E32	NVM	7011	B5	Control
2	H fail protection	HFB			Horizontal Flyback
3	SAA4978	PICNIC	7709	B3	Feature Box
4	Supply 5 V	5V2			+5 V Supply
5	Supply 8 V	8V6			+8 V Supply
6	Slow I^2C-bus blocked				Slow I^2C blocked
7	TDA9330	HOP video control/geometry	7301	B4	Video Controller
8	TDA9320	HIP I/O-video processing	7323	B2	Chroma IF IO
9	X-ray protection			A3	
11	HOP protection				
12	Tuner protection	TUNER_PROT			+8 V (Tuner) Supply
13	UV1316	Tuner	U1200	A7	Tuner
14	MSP3451/3415	ITT sound processor + Dolby	7651	B6	Audio Module
15	Flash protection				
16	Featurebox protection	FBX_PROT			

Remark:If on the DST the text 'ERROR 2' is displayed, this means that the communication from the TV to the DST has failed.

5.6 Protections

5.6.1 General

The EM2E has only one micro-processor (OTC) which remains active during Standby. This because power of the microprocessor and the attached memory chip set is coming from the 3V3 supply, which is derived from the 5V Standby-circuitry. So in both Power-on as in Standby-mode the microprocessor is connected to this power supply.

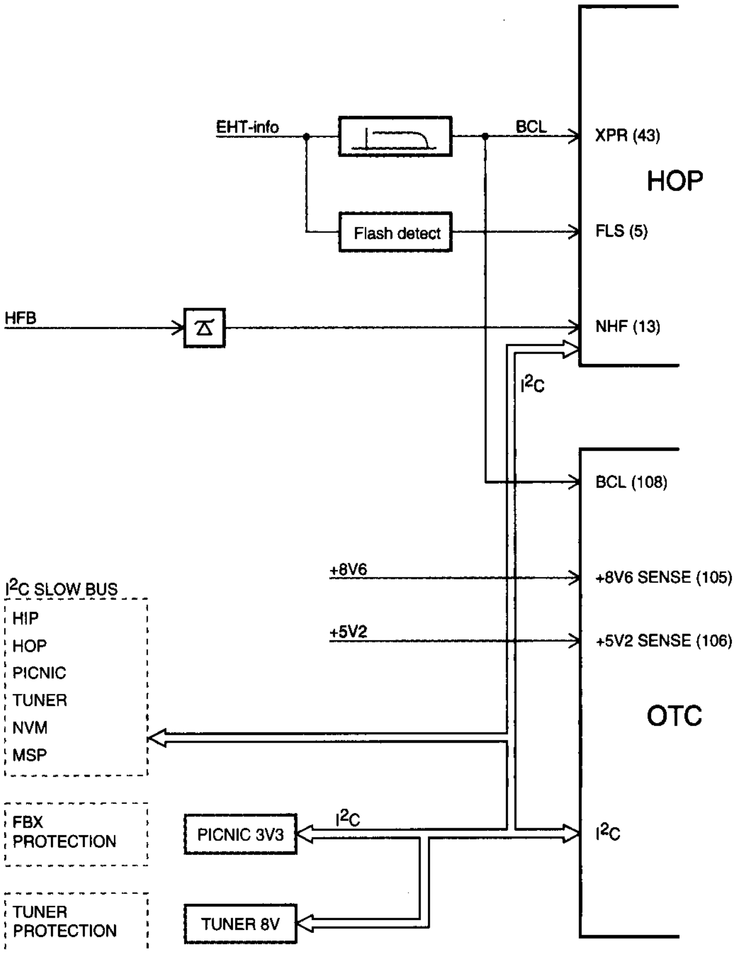
If a fault situation is detected an error code will be generated and if necessary the set will be put in the protection-mode. The protection-mode is indicated by blinking of the red LED at a frequency of 3 Hz. In some error cases the micro processor does not put the set in the protection-mode. The error codes of the error buffer can be read via the service-menu (SAM), the blinking LED procedure or via DST/ComPair. The DST diagnose functionality will force the set into the Service-standby, which is alike the usual Standby, however the micro-processor has to remain in normal operation completely.

To get a quick diagnosis the EM2E has 3 service-modes implemented:

- The Customer Service Mode (CSM).
- The Service Default Mode (SDM). Start-up of the set in a predefined way.
- The Service Alignment Mode (SAM). In this mode items of the set can be adjusted via a menu and with the help of test patterns.

Both SDM & SAM modes can be entered via the 'service pads' on the SSB, via a RC (DST or standard RC) or via ComPair. The SAM can not be entered in Standby, the set has to be in normal operation.

The EM2E 'Protection Diagram' shows the structure of the protection system. See diagram below.



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210100

Figure 5-5

There are several types of protections:

- I^2C related protections
- OTC related protections (via polling on I/O pins or via algorithms).
- HOP related protections (mainly for deflection items).
- Hardware errors which are not sensed by the OTC (e.g. BRIDGE_PROT)

I^2C related protections

In normal operation some registers of the I^2C controlled IC's will be refreshed every 200 msec. During this sequence the I^2C-busses and the I^2C -IC's as well will be checked. The I^2C

protection will take place if the SDA and SCL are whether short circuited to ground or to each other. An I^2C error can also occur, if the power supply of the IC is missing (e.g. TUNER_PROT (error 12) & FBX_PROT (error 16)).

OTC related protections

If a protection is detected at an input of the OTC, all protection inputs of the OTC will be scanned every 200 msec. for 5 times. If the protection on one of the inputs is still activated after 1 sec., then the set will be put in the protection-mode. Before the scanning is started a so-called ESD-refresh will be carried out first, because the interrupt on one of the inputs may be caused either by a FLASH or by ESD. As a FLASH or ESD can harm the settings of some IC's, the HOP-HIP-MSP-PICNIC-NVM and Tuner are initialised again to ensure the normal picture and sound conditions of the set.

- 8.6 V and 5.2 V protection. The presence of the 8.6 V and 5.2 V is sensed by the OTC. If these voltages are not present, then an error code is stored in the error buffer of the NVM, and the set is put in the protection-mode.

HOP related protections

Every 200 msec. the status register of the HOP is read by the OTC via I^2C. If a protection signal is detected on one of the inputs of the HOP, then the relevant error bit in the HOP register is set to 'high'. If the error bit is still 'high' after 1 sec., the OTC will store the error code in the error buffer (NVM) and depending on the relevancy of the error bit the set will either go into the protection-mode or not.

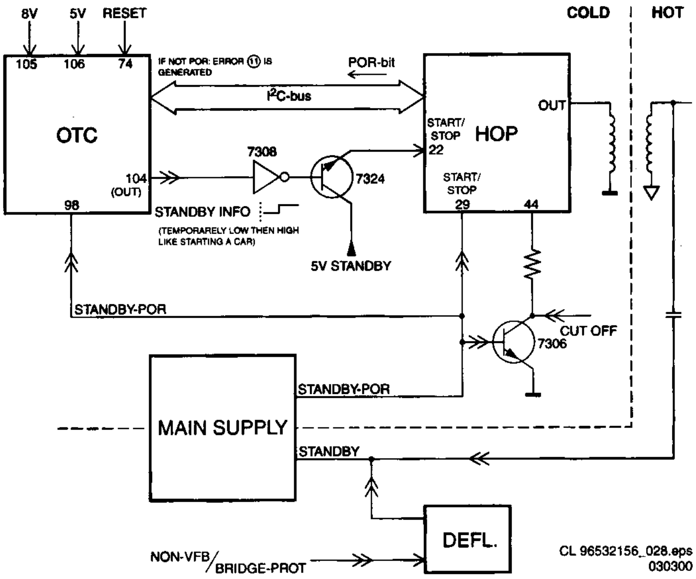
- HFB: Horizontal Flyback. If the horizontal flyback is not present, then this is detected via the HOP (HFB_X-RAY_PROT). One status bit is set to 'high'. The error code is stored in the error buffer and the set will go into the protection mode
- Flash detection. From the EHT-info, via D6303 and T7303 a flash will stop the H-drive and line output stage immediately. The FLS-bit in the status register of the HOP is set to 'high'. As the duration of a flash is very short the FLS-bit will be reset to 'low' again after the flash refresh, so via a slow start the set will be started again.

Hardware related protections

Due to the architecture (with 'hot' deflection) there are two protections that are 'unknown' to the microprocessor, namely the 'BRIDGE_PROT' from the line-stage and the 'NO_VFB' protection form the frame-stage. If one of these protections is triggered, the set is positioned in 'Standby'-mode. The OTC will now try to re-start the set. If this will not succeed after 5 times (after ≈ 1 minute), the OTC will generate error 15 (Flash protection) and will start the blinking red LED.

5.7 Repair tips

5.7.1 General



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030300

Figure 5-6

The start-up of the set is very different as of other sets:

1. When the set is switched 'ON', first the HOP is placed in 'low power start-up' mode (HOP-standby-mode). This means that 5 V (derived from available Standby-supply) is connected to pin 22 of the HOP-IC.
2. Now the HOP is driving the line-circuitry with 50 kHz pulses. At the base of the line-transistor this is sensed via the 'STANDBY'-line.
3. This signal triggers the Main supply to operate. Now the line-stage has 'BAT'-voltage (141 V), it will also start.
4. After the 5 and 8 V-supply lines are sensed by the OTC, it will read the POR-bit from the HOP via the I^2C-bus.
5. Now the HOP is switched in 'ON'-mode and the set will start-up further with normal drive (31.25 kHz for PAL).
6. The last step will be the unblanking of the picture.

SO STANDBY IS NOT CONTROLLED VIA A STANDBY-LINE FROM MICROPROCESSOR, BUT IS ACHIEVED INDIRECTLY VIA THE HOP-CIRCUITRY.

Notice that a very big part of the set (Large Signal Panel) is 'hot', meaning the primary part of the Standby supply, the whole Main supply (except for the secondary Audio supply) and the complete deflection circuit. SO NOTICE THAT THE DEFLECTION-COIL IS HOT!

This set does not have an IR transmitting-LED anymore. In its place, a Service (ComPair) connector is implemented at the rear of the set, which is directly accessible. In addition to this, there is a blinking LED procedure to show the contents of the error buffer.

The relay you hear during switching 'ON' (via the main switch) is from the degaussing-circuitry. So it is not used for switching the supply as in the MG-chassis.

When using ComPair (connect cable to ComPair-connector at the rear of the set, placed behind a separate cover), there exists the possibility to have a stepwise start-up procedure. With this mode one can startup the set step-by-step. This also means that in certain steps some protections will not be activated. This can sometimes be convenient during repair. See table in 5.4.3, which is describing the stepwise start-up mode with belonging LED behaviour.

On the SSB there are 'service pads' implemented to activate (via bridging) the SDM- or SAM-mode (see chapter 4). When the SDM-mode is activated, the processor-controlled protections (so not the Hardware and HOP-protections) can be overruled. This means that the ADC-input protections (5- and 8 V) and the I^2C not-acknowledging info from Tuner and FBX can be overruled.
WHEN DOING SO THE SERVICE-ENGINEER MUST KNOW WHAT HE IS DOING, AS IT COULD LEAD TO DAMAGING THE SET.

'Repair-tips how to repair the Main power supply:

- Simplest way is to replace components of the Main supply with repair kit (3122 785 90100)
- More detailed way:
  - Replace FET 7504 and zener 6505
  - Remove SSB-panel
  - Short-circuit BE of TS7529 in order to put supply in 'on'-mode (TS7529 is blocking then)
  - Load capacitor C2515 (V_{BAT}) with a load of 500 ohm. Supply can not work without a minimum load.
  - Use a variac to slowly increase the V_{MAINS}. Measure over sensing-resistors R3514/15 whether a nice sawtooth-voltage becomes available. Also measure the V_{BAT}-output
  - V_{BAT} may never exceed 141 V. If so there is something wrong in the feedback-circuitry (e.g. regulator 7506)

Repair-tips how to repair the Standby power supply:

- Simplest way is to replace components of the Standby supply with repair kit (3122 785 90110)

Repair-tips how to repair the Deflection-circuitry:

- Simplest way is to replace components of the Deflection-circuitry with repair kit (3122 785 90120)

Service-tips:

- Be careful measuring on gate of FET 7504. Circuitry is very high ohmic and can easily be damaged.
- Take care not to touch 'hot' heatsink while disconnecting SSB, despite the fact that mains cord is out of mains socket. There still is an annoying rest-voltage for a short while.
- Do not try to measure on side of SSB directed to the hot heatsink. This is dangerous. All service test points are guided to the Tuner side and are pointed out by service printing. Where the circuitry was too crowded to place this service-printing it has been explained on the Test point overviews in this manual

5.7.2 Repair tips

Phenomenon	Possible Cause	Repair-tip
No picture, no LED.	Standby Supply defective.	Measure circuitry (see diagram A2). Start at testpoint P16. Regardless the mode of the set, this voltage should always be available.
No picture, red LED (high intensity) despite expectation the set should be 'on' (this looks like Standby).	There are 2 protections that are not 'seen' by processor, that force set in 'Standby'-mode, namely 'NO-VFB-prot' (= no frame-deflection), or 'BRIDGE_PROT' (safety error).	If protection is activated by 'NO_VFB-prot', this can be measured with a scope on service test point F10 (diagram A4). Before this protection is activated, a few seconds a horizontal white line is visible. The 'BRIDGE_PROT' error may never occur. Is implemented due to legal requirements. Flash protection error (15) will be generated in both cases after 5 restart attempts. Visible via blinking LED procedure. NO_VFB-prot can be determinated by white line.
No picture, red LED blinking (3 Hz).	Set is in protection due to various causes. For error codes see error-code list.	You have no picture, so: - or you read out error buffer via ComPair - or you read out blinking LED information via 'diagnose' x dealer remote - or you read out blinking LED sequence via <default>-button dealer remote - or you read out blinking LED sequence via service default mode entered via RC-command 062596 + 'menu' When error is known, check circuitry related to supply-voltage and I^2C-communication.
No picture, red LED blinking code 6,6,6 or 1,1,1	No communication on I^2C-bus or NVM-I^2C-bus to processor. Set is in protection-mode	As processor cannot communicate with one of the 2 busses it spontaneously starts blinking. Measure dependent of the error on the I^2C-bus which device is loading the bus. This protection can be overruled via SDM-entry on SSB or via stepwise start-up mode step 'MainPowerOn'.
No picture, no sound, set is making audible squeaking sound	Supply could be in hiccup-mode which can be heard via supply-transformer squeaking	This could be caused by: - Short-circuited V_{BAT} (caused by short circuited line transistor 7421) or - Short-circuited sound-winding (amplifier is short-circuiting 28 V) or - Short-circuited D6514 (due to a too high V_{BAT}). Delete excessive load to see where failure is caused by or check feed back circuit. See repair-tip main power supply (supply needs a minimal load).
No picture, no sound, LED works fine	Supply does not work correctly	If e.g. V_{BAT} is only about 90 V, regulator-IC 7506 could be damaged.
No RC5-reception. Red LED does not echo RC-commands.	Processor-circuitry or RC-receiver is wrong.	In case set reacts on local keyboard operation, error must be found in the IR-receiver circuitry (diagram E).
Relay-activation (degaussing) not audible when switch set 'on' from 'off'.	Processor not working correctly.	Check RESET-circuitry on diagram B5. When switching on the set all i/o-pins of processor should become high for a moment, so also the degauss-input signal.
No sound, but picture.	Measure P7 on diagram A1. Possible sound-amplifier is broken (but not short-circuited), or sound-enable line is high (see diagram A5). Further the audio-signal path must be measured (HIP, MSP, switch-IC's, amplifier).	Measure and repair. With ComPair there is a beep-test that can determine where the signal stops (use loudspeakers, headphone).
No sound at headphone output.	Discrete amplifiers or supply to it could be damaged.	Measure A12, A13, A14, A15 and supply-line on diagram A6.
Picture is rotated.	Rotation-circuitry or supply to it could be damaged.	Measure test points F3, R1, R2 on diagram A4.
No picture.	Check functionality and cabling Tuner to SSB.	Notice cable 0946.
Picture looks like cushion, further O.K.	Or NVM-content is overwritten or E/W-MOSFET is short-circuited	First check in Service Alignment Mode, whether geometry can be restored. If not check testpoint L4 and diagram A3, or measure with an ohm-meter whether TS7480 is defective.
Very white picture, with flyback lines visible	180 V is missing on CRT-panel	Probably R3468 on LSP (diagram A3) is interrupted, or bad connection plug 0324 to 0224 (CRT-panel).
Un-sharp picture	Focus could be mis-aligned or SCAVEM-circuitry does not work correctly	Align focus-potmeter of Line Transformer; check SCAVEM-circuitry on CRT-panel [F].
Un-synced picture	Sync is derived in HIP-IC from X-tals 1305 and/or 1308	Maybe a X-tal is making bad contact.
Picture distorted.	Check video-path, service default mode.	Investigate whether there exist an error code in the error buffer. In case there is an error code, check I^2C-bus and/or supply-lines (see overview supply-lines). Measure and check signal path Tuner, HIP, PICNIC, HOP, RGB-amplifier. In case it is a geometry-issue, check Frame-circuitry, alignments or possible corrupted NVM (7011)
No menu, OSD.	Probably processor is defective.	Measure test points C7, C8, C9, C10 on diagram B5.

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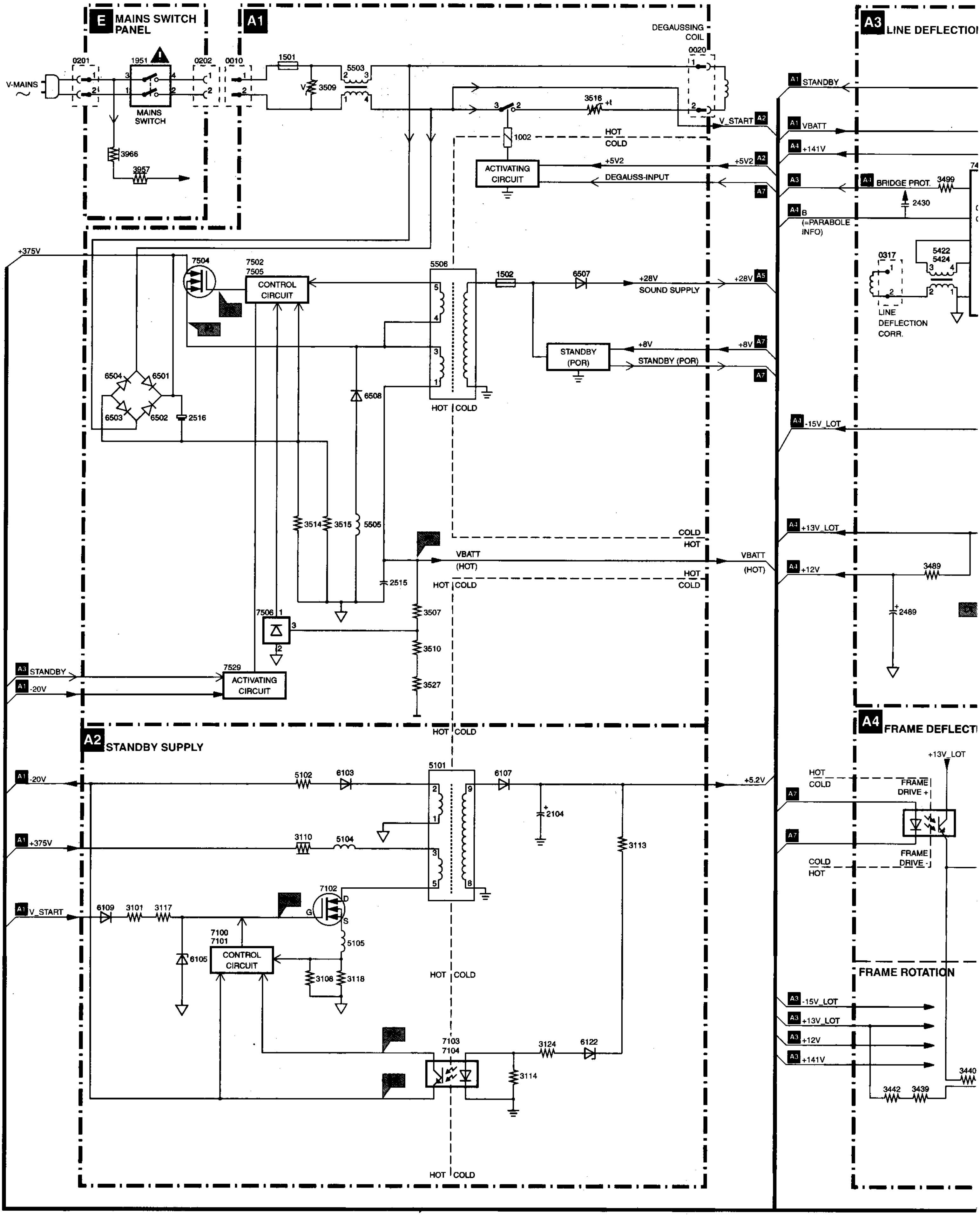
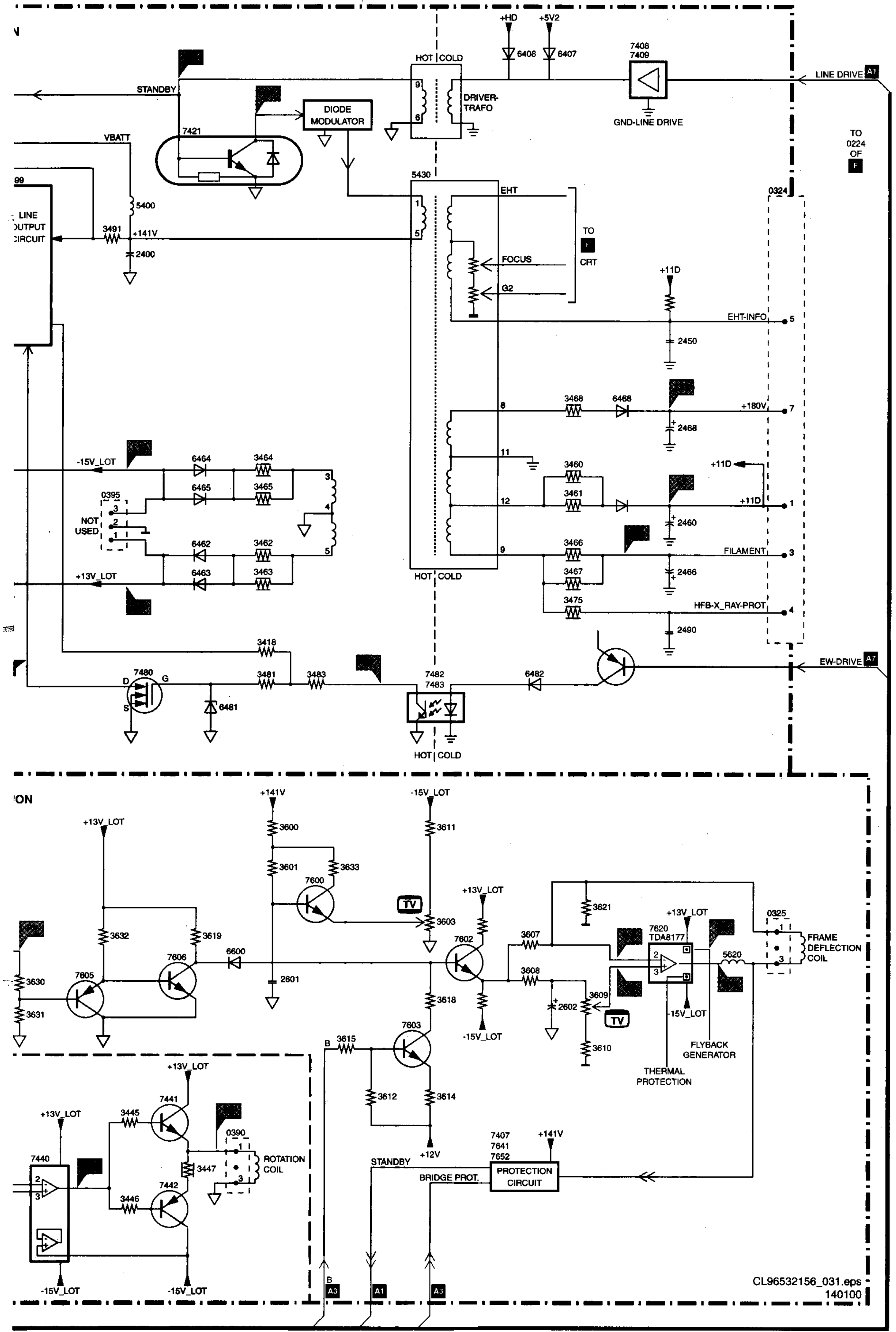
090200

6. Wiring diagram, blockdiagram, supply diagram and testpoints

Blockdiagram


E MAINS SWITCH PANEL
A1
A2 STANDBY SUPPLY
A3 LINE DEFLECTIO
A4 FRAME DEFLECTI
FRAME ROTATION
V-MAINS
0201
1951
MAINS SWITCH
0202
0010
3966
3957
1501
5503
3509
DEGAUSSING COIL
0020
3516
1002
HOT
COLD
ACTIVATING CIRCUIT
+5V2
DEGAUSS-INPUT
V_START
+375V
7504
7502
7505
CONTROL CIRCUIT
5506
1502
6507
+28V
SOUND SUPPLY
+8V
STANDBY (POR)
6504
6501
6503
6502
2516
6508
3514
3515
5505
2515
VBATT (HOT)
7506
3507
3510
3527
7529
STANDBY
-20V
5102
6103
5101
6107
+5.2V
2104
3113
3110
5104
6109
3101
3117
7102
7100
7101
6105
5105
3108
3118
7103
7104
3124
6122
3114
VBATT
+141V
BRIDGE PROT.
3499
2430
B (=PARABOLE INFO)
0317
5422
5424
LINE DEFLECTION CORR.
-15V_LOT
+13V_LOT
+12V
3489
2489
FRAME DRIVE +
FRAME DRIVE -
3442
3439
3440


N
STANDBY
VBATT
7421
DIODE MODULATOR
HOT | COLD
+HD
+5V2
6408
6407
9
6
DRIVER-TRAFO
7408
7409
GND-LINE DRIVE
LINE DRIVE A1
TO 0224 OF F
99
LINE OUTPUT CIRCUIT
5400
3491
+141V
2400
5430
1
5
EHT
FOCUS
G2
TO F CRT
0324
+11D
EHT-INFO
5
2450
8
3468
6468
+180V
7
2468
11
3460
3461
+11D
12
+11D
1
2460
9
3466
FILAMENT
3
2466
3467
3475
HFB-X_RAY-PROT
4
2490
-15V_LOT
6464
3464
6465
3465
0395
NOT USED
3
2
1
4
6462
3462
6463
3463
+13V_LOT
HOT COLD
3418
7480
D
G
S
3481
3483
6481
7482
7483
6482
EW-DRIVE A7
HOT | COLD
ON
+141V
-15V_LOT
3600
3611
+13V_LOT
3601
3633
7600
TV
3603
+13V_LOT
3621
3632
3619
7602
3607
+13V_LOT
7620
TDA8177
0325
1
2
3
FRAME DEFLECTION COIL
5620
3630
7605
7606
6600
2601
3608
3609
2602
TV
-15V_LOT
3631
3618
-15V_LOT
FLYBACK GENERATOR
B
3615
7603
3610
THERMAL PROTECTION
+13V_LOT
7441
3612
3614
+13V_LOT
3445
0390
ROTATION COIL
3447
+12V
7407
7641
7652
+141V
7440
STANDBY
PROTECTION CIRCUIT
BRIDGE PROT.
7442
3446
-15V_LOT
-15V_LOT
B
A3
A1
A3
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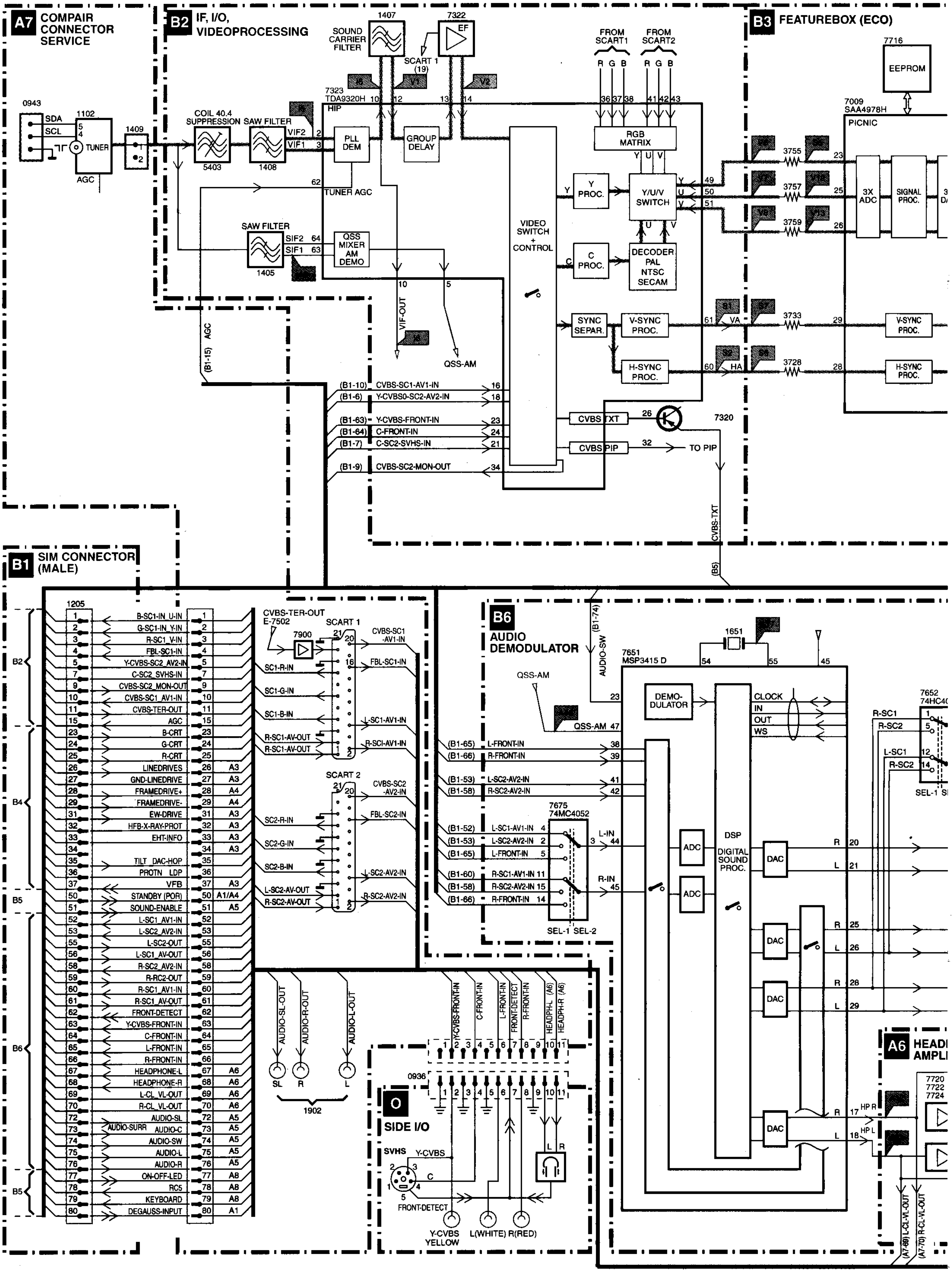
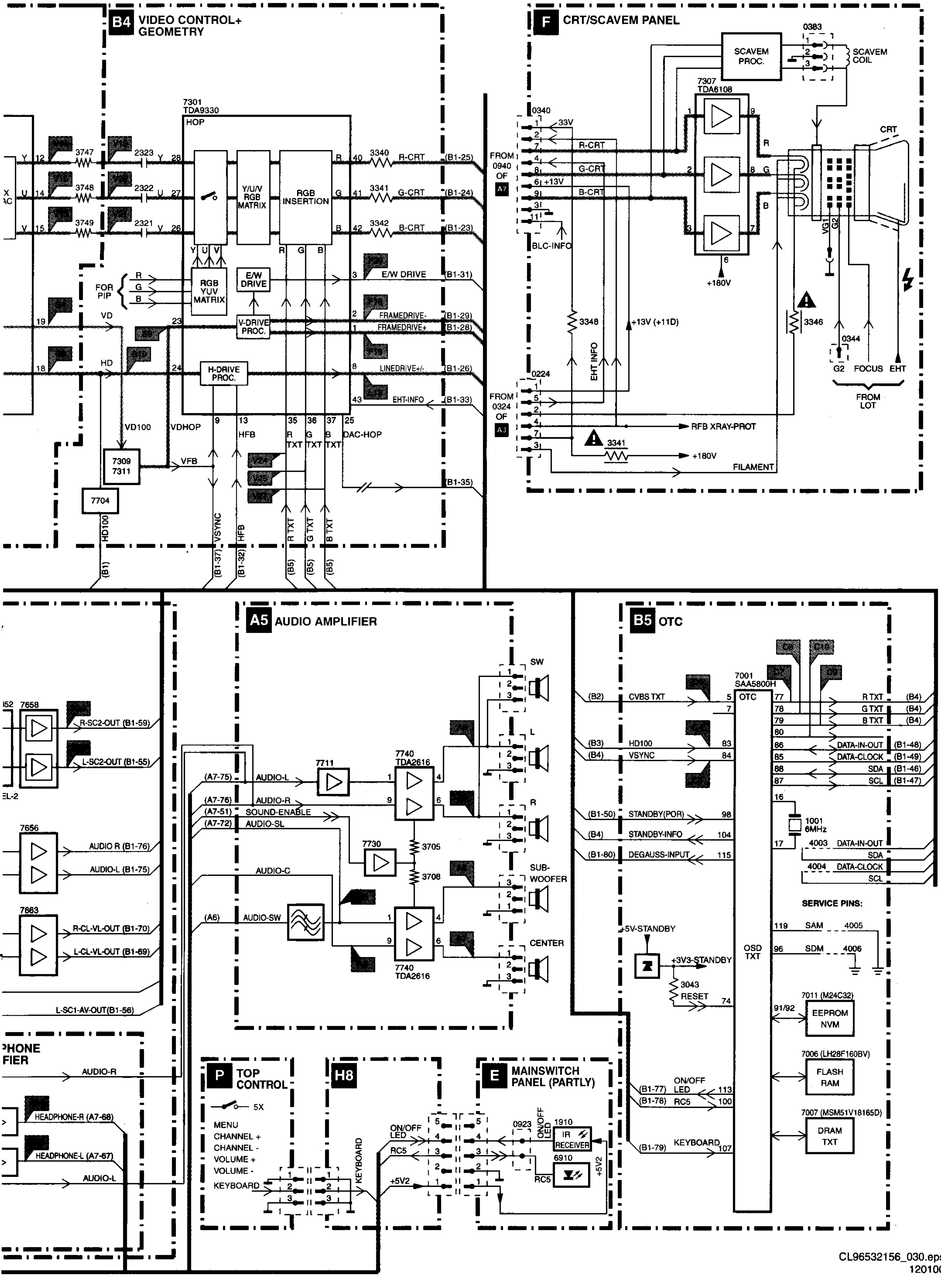
140100

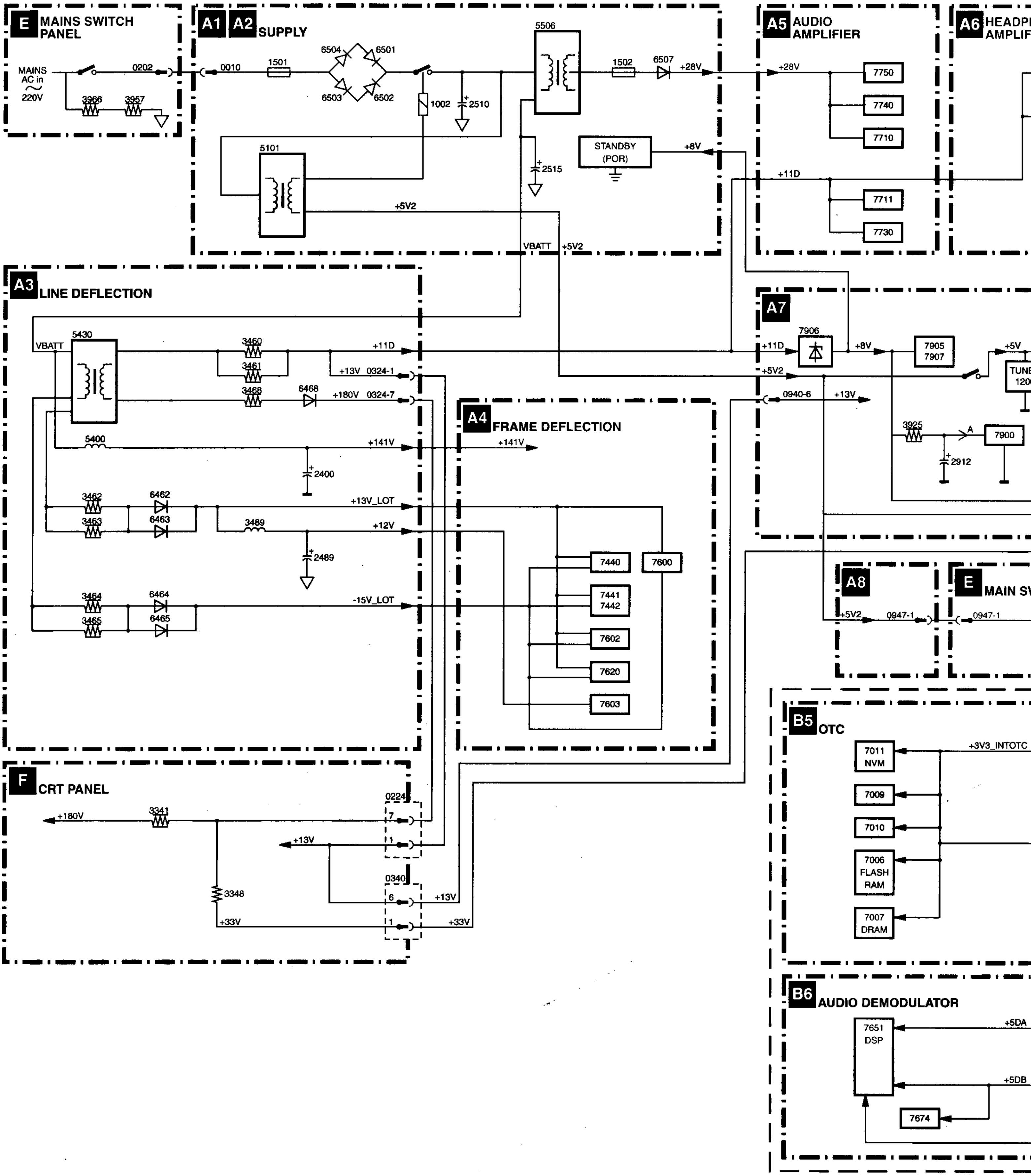
Blockdiagram

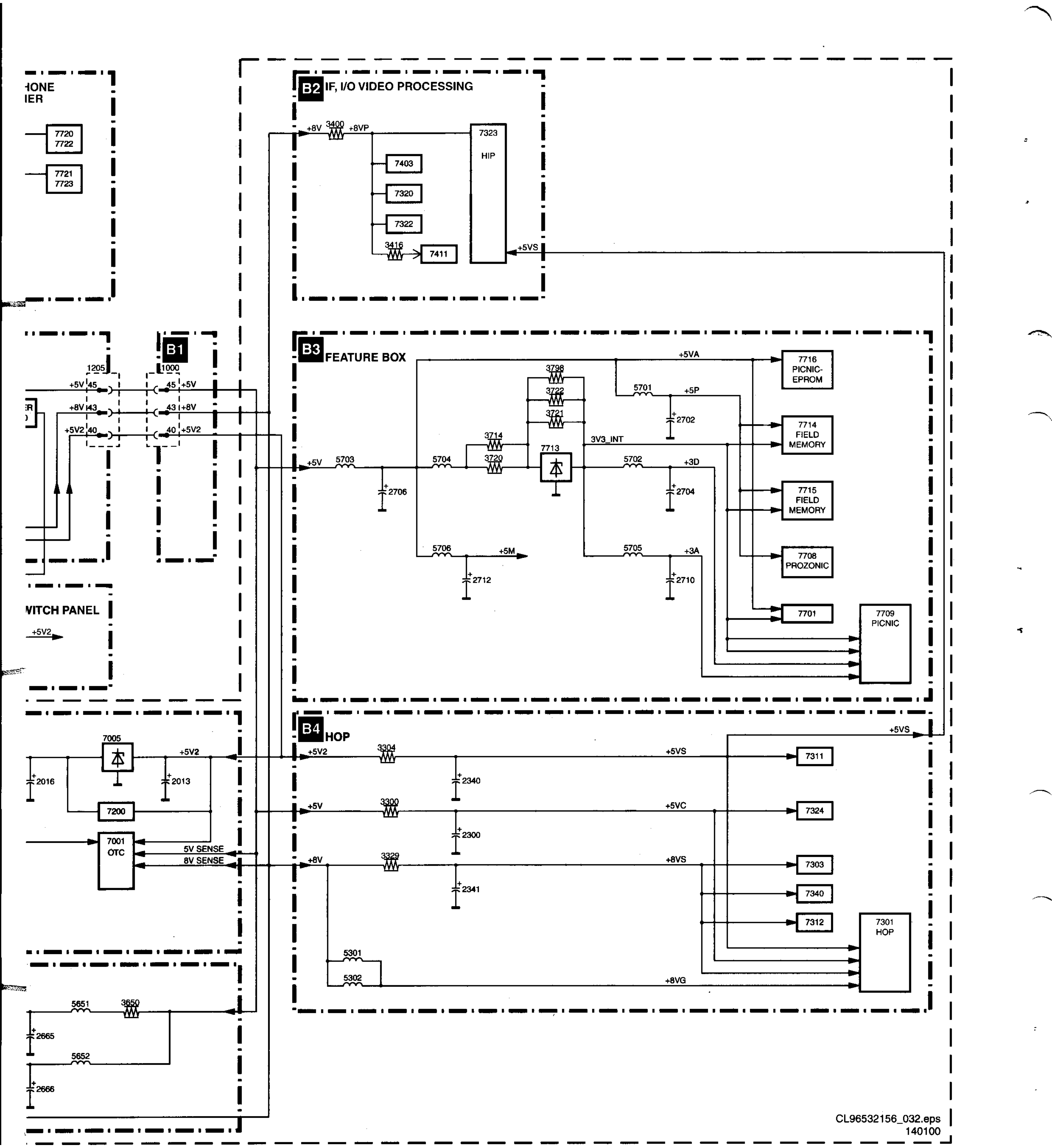

A7 COMPAIR CONNECTOR SERVICE
0943
SDA
SCL
1102
TUNER
AGC
1409
B2 IF, I/O, VIDEOPROCESSING
COIL 40.4 SUPPRESSION
SAW FILTER
5403
1408
VIF2
VIF1
SOUND CARRIER FILTER
1407
7322
EF
SCART 1 (19)
7323 TDA9320H HIP
PLL DEM
GROUP DELAY
TUNER AGC
SAW FILTER
SIF2
SIF1
1405
QSS MIXER AM DEMO
VIF-OUT
QSS-AM
VIDEO SWITCH + CONTROL
FROM SCART1
FROM SCART2
R G B
RGB MATRIX
Y PROC.
C PROC.
Y/U/V SWITCH
DECODER PAL NTSC SECAM
SYNC SEPAR.
V-SYNC PROC.
H-SYNC PROC.
CVBS TXT
CVBS PIP
TO PIP
7320
CVBS-TXT
(B1-15) AGC
(B1-10) CVBS-SC1-AV1-IN
(B1-6) Y-CVBS0-SC2-AV2-IN
(B1-63) Y-CVBS-FRONT-IN
(B1-64) C-FRONT-IN
(B1-7) C-SC2-SVHS-IN
(B1-9) CVBS-SC2-MON-OUT
B3 FEATUREBOX (ECO)
7716
EEPROM
7009 SAA4978H
PICNIC
3755
3757
3759
3733
3728
3X ADC
SIGNAL PROC.
V-SYNC PROC.
H-SYNC PROC.
VA
HA
B1 SIM CONNECTOR (MALE)
1205
B-SC1-IN_U-IN
G-SC1-IN_Y-IN
R-SC1_V-IN
FBL-SC1-IN
Y-CVBS-SC2_AV2-IN
C-SC2_SVHS-IN
CVBS-SC2_MON-OUT
CVBS-SC1_AV1-IN
CVBS-TER-OUT
AGC
B-CRT
G-CRT
R-CRT
LINEDRIVES
GND-LINEDRIVE
FRAMEDRIVE+
FRAMEDRIVE-
EW-DRIVE
HFB-X-RAY-PROT
EHT-INFO
TILT_DAC-HOP
PROTN_LDP
VFB
STANDBY (POR)
SOUND-ENABLE
L-SC1_AV1-IN
L-SC2_AV2-IN
L-SC2-OUT
L-SC1_AV-OUT
R-SC2_AV2-IN
R-RC2-OUT
R-SC1_AV1-IN
R-SC1_AV-OUT
FRONT-DETECT
Y-CVBS-FRONT-IN
C-FRONT-IN
L-FRONT-IN
R-FRONT-IN
HEADPHONE-L
HEADPHONE-R
L-CL_VL-OUT
R-CL_VL-OUT
AUDIO-SL
AUDIO-SURR
AUDIO-C
AUDIO-SW
AUDIO-L
AUDIO-R
ON-OFF-LED
RC5
KEYBOARD
DEGAUSS-INPUT
A3 A4 A1/A4 A5 A6 A8 A1
B2 B4 B5 B6
CVBS-TER-OUT E-7502
7900
SCART 1
CVBS-SC1 -AV1-IN
FBL-SC1-IN
SC1-R-IN
SC1-G-IN
SC1-B-IN
L-SC1-AV1-IN
R-SC1-AV-OUT
R-SC1-AV1-IN
SCART 2
CVBS-SC2 -AV2-IN
FBL-SC2-IN
SC2-R-IN
SC2-G-IN
SC2-B-IN
L-SC2-AV2-IN
L-SC2-AV-OUT
R-SC2-AV-OUT
R-SC2-AV2-IN
AUDIO-SL-OUT
AUDIO-R-OUT
AUDIO-L-OUT
SL R L
1902
B6 AUDIO DEMODULATOR
(B1-74) AUDIO-SW
QSS-AM
7651 MSP3415 D
1651
DEMO-DULATOR
CLOCK IN OUT WS
(B1-65) L-FRONT-IN
(B1-66) R-FRONT-IN
(B1-53) L-SC2-AV2-IN
(B1-58) R-SC2-AV2-IN
7675 74MC4052
(B1-52) L-SC1-AV1-IN
(B1-53) L-SC2-AV2-IN
(B1-65) L-FRONT-IN
(B1-60) R-SC1-AV1-IN
(B1-58) R-SC2-AV2-IN
(B1-66) R-FRONT-IN
L-IN
R-IN
SEL-1 SEL-2
ADC
DSP DIGITAL SOUND PROC.
DAC
R L
7652 74HC4
R-SC1 R-SC2 L-SC1 R-SC2
SEL-1
A6 HEAD AMPL
7720 7722 7724
HP R
HP L
(A7-69) L-CL-VL-OUT
(A7-70) R-CL-VL-OUT
Y-CVBS-FRONT-IN
C-FRONT-IN
L-FRONT-IN
FRONT-DETECT
R-FRONT-IN
HEADPH-L (A6)
HEADPH-R (A6)
0936
O SIDE I/O
SVHS
Y-CVBS
C
FRONT-DETECT
Y-CVBS YELLOW
L(WHITE)
R(RED)


B4 VIDEO CONTROL+ GEOMETRY
7301
TDA9330
HOP
3747
3748
3749
2323
2322
2321
Y
U
V
12
14
15
28
27
26
Y/U/V RGB MATRIX
RGB INSERTION
R
G
B
40
41
42
3340
3341
3342
R-CRT
G-CRT
B-CRT
(B1-25)
(B1-24)
(B1-23)
FOR PIP
RGB YUV MATRIX
E/W DRIVE
3
E/W DRIVE
(B1-31)
V-DRIVE PROC.
2
1
FRAMEDRIVE-
FRAMEDRIVE+
(B1-29)
(B1-28)
H-DRIVE PROC.
8
LINEDRIVE+/-
(B1-26)
43
EHT-INFO
(B1-33)
19
VD
23
18
HD
24
VD100
VDHOP
9
13
HFB
35
36
37
25
R TXT
G TXT
B TXT
DAC-HOP
7309
7311
VFB
7704
(B1-35)
HD100
VSYNC
HFB
R TXT
G TXT
B TXT
(B1)
(B1-37)
(B1-32)
(B5)
(B5)
(B5)
F CRT/SCAVEM PANEL
SCAVEM PROC.
0383
1
2
3
SCAVEM COIL
7307
TDA6108
1
9
2
8
3
7
6
+180V
0340
33V
R-CRT
G-CRT
+13V
B-CRT
FROM 0940 OF A7
BLC-INFO
CRT
R
G
B
VG1
G2
3348
+13V (+11D)
EHT INFO
3346
0344
G2
FOCUS
EHT
FROM LOT
0224
FROM 0324 OF A3
RFB XRAY-PROT
3341
+180V
FILAMENT
A5 AUDIO AMPLIFIER
SW
L
R
SUB-WOOFER
CENTER
7740
TDA2616
7711
(A7-75)
AUDIO-L
(A7-76)
AUDIO-R
(A7-51)
SOUND-ENABLE
(A7-72)
AUDIO-SL
7730
3705
3708
AUDIO-C
(A6)
AUDIO-SW
7740
TDA2616
7658
R-SC2-OUT (B1-59)
L-SC2-OUT (B1-55)
7656
AUDIO R (B1-76)
AUDIO-L (B1-75)
7663
R-CL-VL-OUT (B1-70)
L-CL-VL-OUT (B1-69)
L-SC1-AV-OUT(B1-56)
PHONE
FIER
AUDIO-R
HEADPHONE-R (A7-68)
HEADPHONE-L (A7-67)
AUDIO-L
B5 OTC
7001
SAA5800H
OTC
(B2)
CVBS TXT
5
7
(B3)
HD100
83
(B4)
VSYNC
84
77
78
79
80
86
85
88
87
R TXT
G TXT
B TXT
(B4)
(B4)
(B4)
DATA-IN-OUT
DATA-CLOCK
SDA
SCL
(B1-48)
(B1-49)
(B1-46)
(B1-47)
16
1001
6MHz
17
4003
DATA-IN-OUT
SDA
4004
DATA-CLOCK
SCL
(B1-50)
STANDBY(POR)
98
(B4)
STANDBY-INFO
104
(B1-80)
DEGAUSS-INPUT
115
SERVICE PINS:
119
SAM
4005
96
SDM
4006
+5V-STANDBY
+3V3-STANDBY
3043
RESET
74
OSD TXT
7011 (M24C32)
91/92
EEPROM NVM
7006 (LH28F160BV)
FLASH RAM
7007 (MSM51V18165D)
DRAM TXT
(B1-77)
ON/OFF LED
113
(B1-78)
RC5
100
(B1-79)
KEYBOARD
107
P TOP CONTROL
5X
MENU
CHANNEL +
CHANNEL -
VOLUME +
VOLUME -
KEYBOARD
H8
KEYBOARD
ON/OFF LED
RC5
+5V2
E MAINSWITCH PANEL (PARTLY)
0923
ON/OFF LED
1910
IR RECEIVER
6910
RC5
+5V2

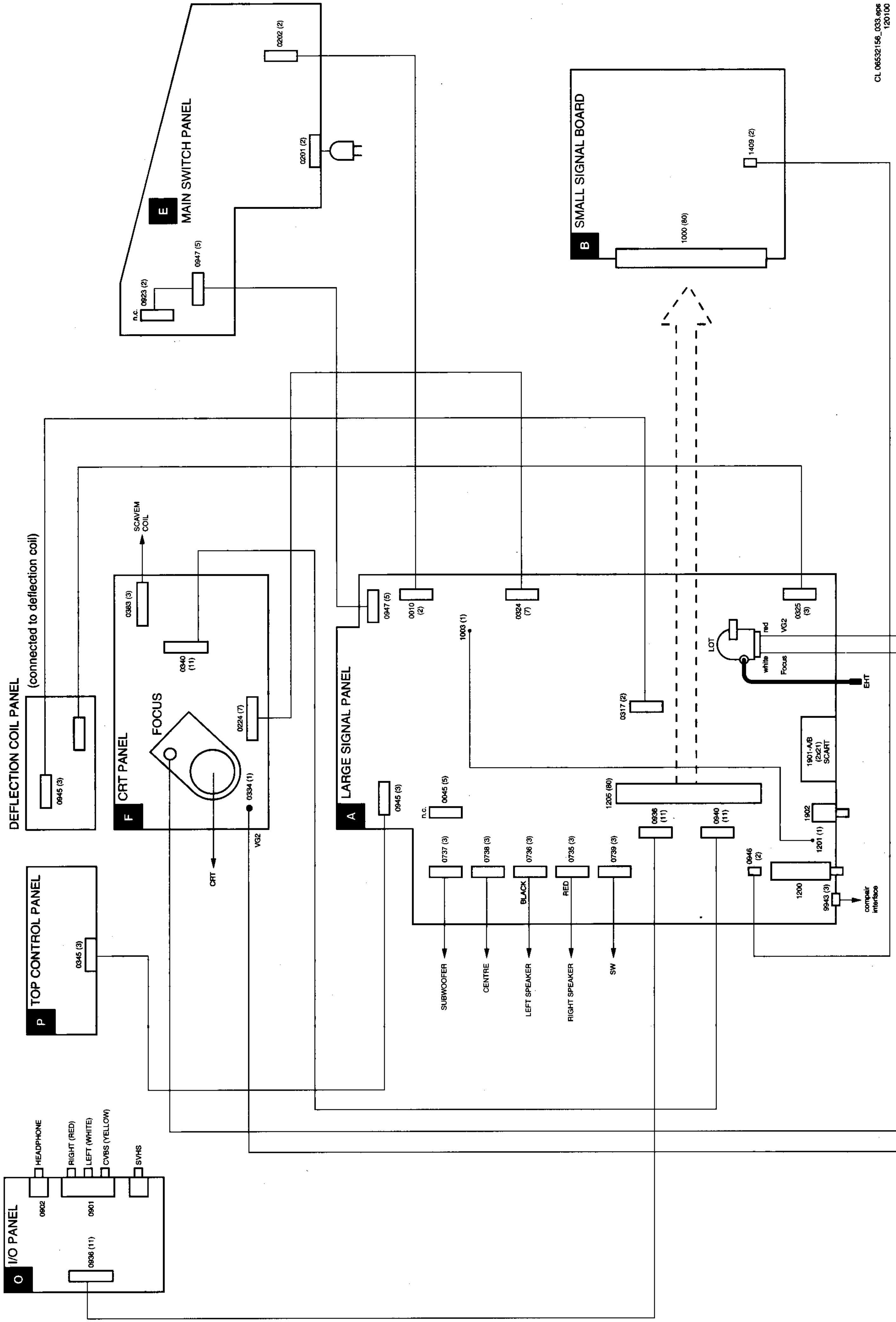
CL96532156_030.eps
120100

Supply lines overview

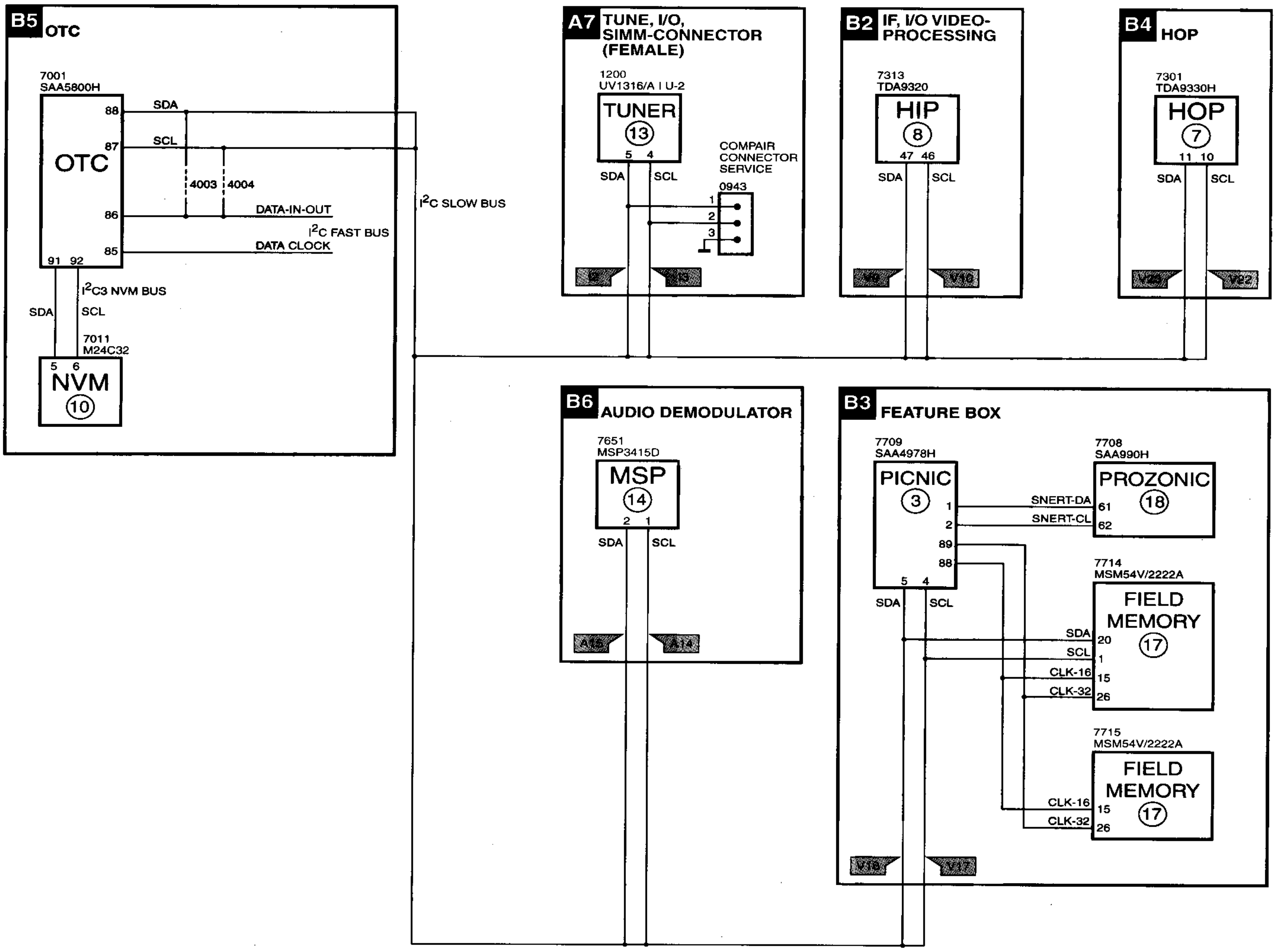

E MAINS SWITCH PANEL
MAINS AC in 220V
0202
3966
3957
A1 A2 SUPPLY
0010
1501
6504
6501
6503
6502
1002
2510
5506
1502
6507
+28V
5101
2515
STANDBY (POR)
+8V
+5V2
VBATT
+5V2
A5 AUDIO AMPLIFIER
+28V
7750
7740
7710
+11D
7711
7730
A6 HEADPH AMPLIF
A3 LINE DEFLECTION
VBATT
5430
3460
3461
+11D
+13V 0324-1
3468
6468
+180V 0324-7
5400
+141V
2400
3462
6462
3463
6463
+13V_LOT
3489
+12V
2489
3464
6464
3465
6465
-15V_LOT
A4 FRAME DEFLECTION
+141V
7440
7600
7441 7442
7602
7620
7603
A7
7906
+11D
+8V
7905 7907
+5V
TUNE 120
+5V2
0940-6
+13V
3925
A
7900
2912
A8
+5V2
0947-1
E MAIN SW
0947-1
F CRT PANEL
+180V
3341
0224
7
1
+13V
0340
6
+13V
3348
1
+33V
+33V
B5 OTC
+3V3_INTOTC
7011 NVM
7009
7010
7006 FLASH RAM
7007 DRAM
B6 AUDIO DEMODULATOR
7651 DSP
+5DA
+5DB
7674


HONE
IER
7720
7722
7721
7723
B2
IF, I/O VIDEO PROCESSING
+8V
3400
+8VP
7323
HIP
7403
7320
7322
3416
7411
+5VS
B1
1205
1000
+5V
45
+8V
43
+5V2
40
B3
FEATURE BOX
+5VA
7716
PICNIC-
EPROM
3798
3722
3721
5701
+5P
2702
7714
FIELD
MEMORY
3714
3720
3V3_INT
+5V
5703
5704
7713
5702
+3D
2706
2704
7715
FIELD
MEMORY
5706
+5M
5705
+3A
2712
2710
7708
PROZONIC
7701
7709
PICNIC
WITCH PANEL
+5V2
B4
HOP
7005
+5V2
2016
2013
7200
3304
+5VS
7311
2340
3300
+5VC
7324
2300
7001
OTC
5V SENSE
8V SENSE
3329
+8VS
7303
2341
7340
7312
7301
HOP
5301
5302
+8VG
5651
3650
2665
5652
2666
CL96532156_032.eps
140100

I2C bus


CL 06532156_033.eps
120100
E MAIN SWITCH PANEL
0202 (2)
0201 (2)
0947 (5)
0923 (2)
n.c.
B SMALL SIGNAL BOARD
1409 (2)
1000 (80)
DEFLECTION COIL PANEL
(connected to deflection coil)
0945 (3)
F CRT PANEL
0383 (3)
SCAVEM COIL
0340 (11)
FOCUS
0224 (7)
0334 (1)
VG2
CRT
A LARGE SIGNAL PANEL
0947 (5)
0010 (2)
0324 (7)
0325 (3)
1003 (1)
LOT
red
VG2
white
Focus
EHT
0317 (2)
1901-A/B (2x21) SCART
1205 (80)
0945 (3)
n.c.
0045 (5)
0936 (11)
0940 (11)
1902
1201 (1)
0946 (2)
1200
9943 (3)
compair interface
0737 (3)
0738 (3)
0736 (3)
0735 (3)
0739 (3)
BLACK
RED
SUBWOOFER
CENTRE
LEFT SPEAKER
RIGHT SPEAKER
SW
P TOP CONTROL PANEL
0345 (3)
O I/O PANEL
HEADPHONE
RIGHT (RED)
LEFT (WHITE)
CVBS (YELLOW)
SVHS
0902
0901
0936 (11)

I2C overview


B5
OTC
7001
SAA5800H
OTC
88
87
86
85
91 92
SDA
SCL
4003
4004
DATA-IN-OUT
I2C FAST BUS
DATA CLOCK
I2C3 NVM BUS
SDA
SCL
7011
M24C32
5 6
NVM
10
I2C SLOW BUS
A7
TUNE, I/O, SIMM-CONNECTOR (FEMALE)
1200
UV1316/A I U-2
TUNER
13
5 4
SDA
SCL
COMPAIR CONNECTOR SERVICE
0943
1
2
3
B2
IF, I/O VIDEO-PROCESSING
7313
TDA9320
HIP
8
47 46
SDA
SCL
V10
B4
HOP
7301
TDA9330H
HOP
7
11 10
SDA
SCL
V22
B6
AUDIO DEMODULATOR
7651
MSP3415D
MSP
14
2 1
SDA
SCL
A14
B3
FEATURE BOX
7709
SAA4978H
PICNIC
3
1
2
89
88
5 4
SDA
SCL
7708
SAA990H
PROZONIC
18
SNERT-DA
SNERT-CL
61
62
7714
MSM54V/2222A
FIELD MEMORY
17
SDA
SCL
CLK-16
CLK-32
20
1
15
26
7715
MSM54V/2222A
FIELD MEMORY
17
CLK-16
CLK-32
15
26
V17

Error	Device	Description	Defective item	Diagram	Defect. module indication
1	Beam Current protection	BC-PROT			Beam Current
2	H fail protection	HFB			Horizontal Flyback
3	SAA4978	PICNIC	7709	B3	Feature Box
4	Supply 5V	5V2			+5V Supply
5	Supply 5V	8V6			+8V Supply
6	Slow I^{2}C-bus blocked				Slow I^{2}C blocked
7	TDA9330	HOP video control/geometry	7301	B4	Video Controller
8	TDA9320	HIP I/O-video processing	7323	B2	Chroma IF IO
9	X-ray protection			A3	
10	ST24E32	NVM	7011	B5	Control
11	HOP protection				
12	Tuner protection	TUNER_prot			+8V (Tuner) Supply
13	UV1316	Tuner	U1200	A7	Tuner
14	MSP3451/3415	ITT sound processor + Dolby	7651	B6	Audio Module
15	Flash protection				
16	Featurebox protection	FBX_PROT			
17	SAA4956	DNR-memory	7714	B3	
18	SAA4990	PROZONIC	7708	B3	

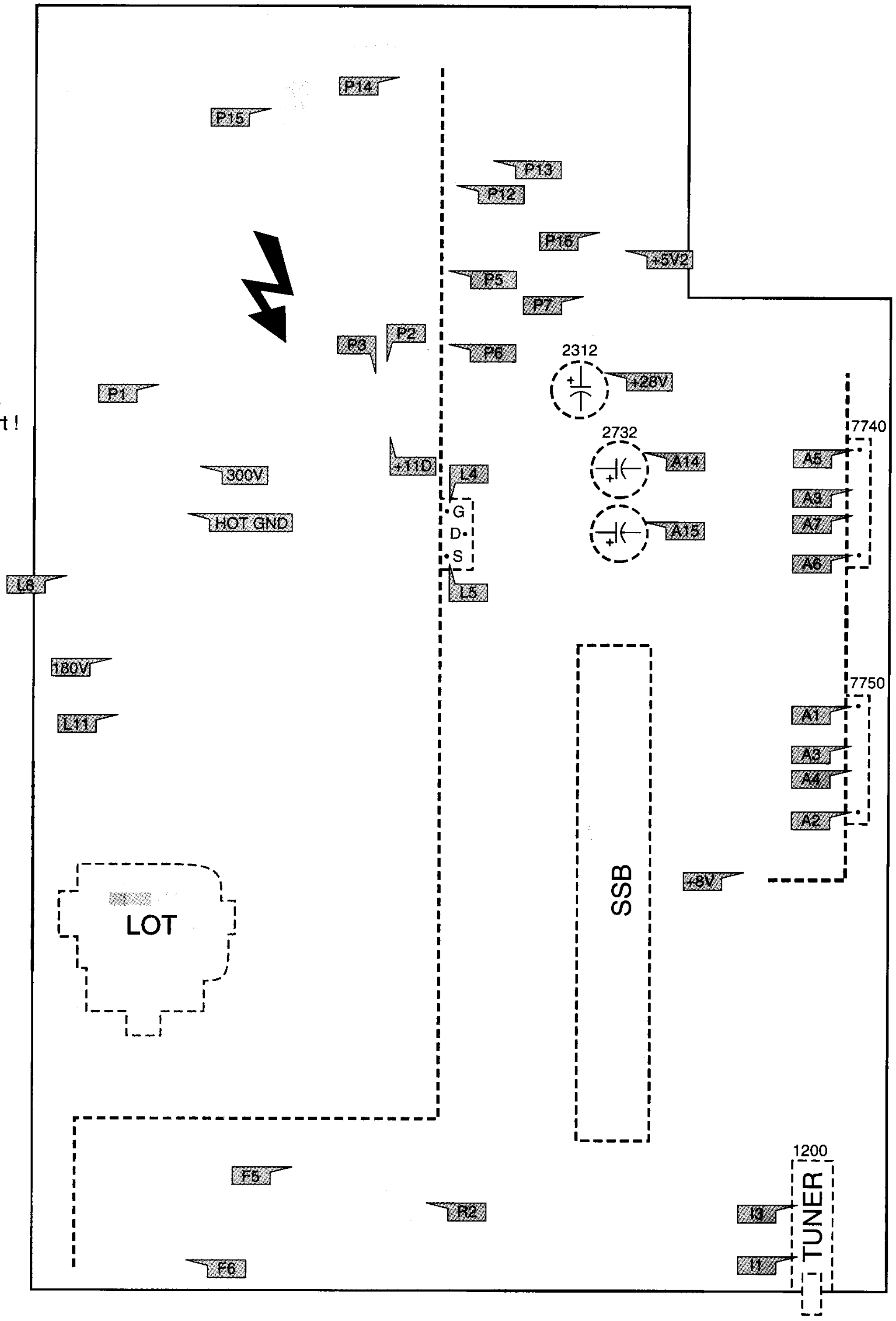
CL96532156_034.eps
140100

Testpoint overview LSP panel

Large Signal panel (LSP)
(copper side)

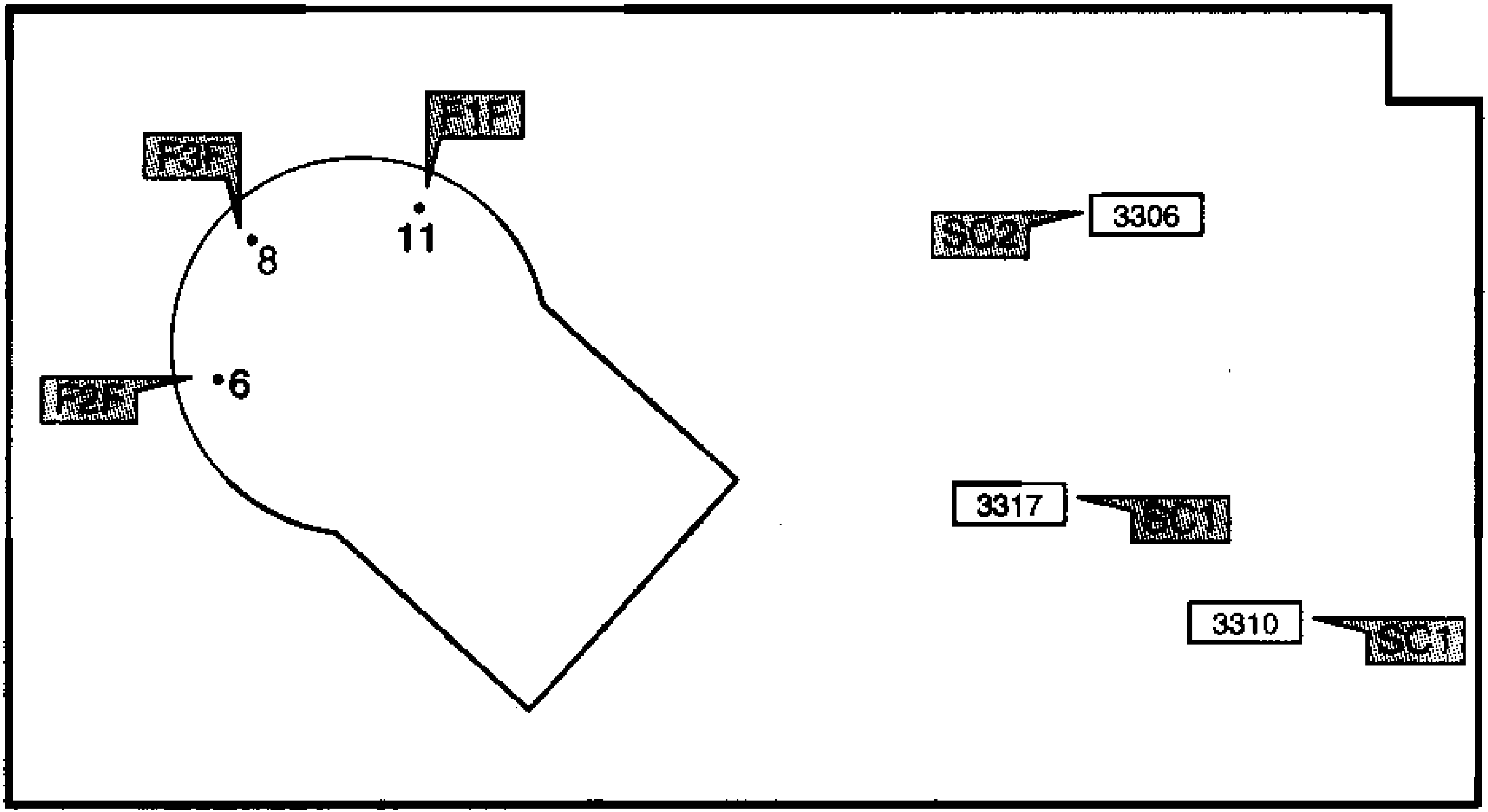
Warning

All alignments are on hot-part !


P14
P15
P13
P12
P16
+5V2
P5
P7
P3
P2
P6
2312
+28V
P1
2732
A14
7740
A5
A3
A7
A6
+11D
L4
300V
G
D
S
HOT GND
A15
L5
L8
180V
7750
A1
A3
A4
A2
L11
SSB
+8V
LOT
1200
TUNER
F5
R2
I3
I1
F6

CL 96532156_088.eps
280200

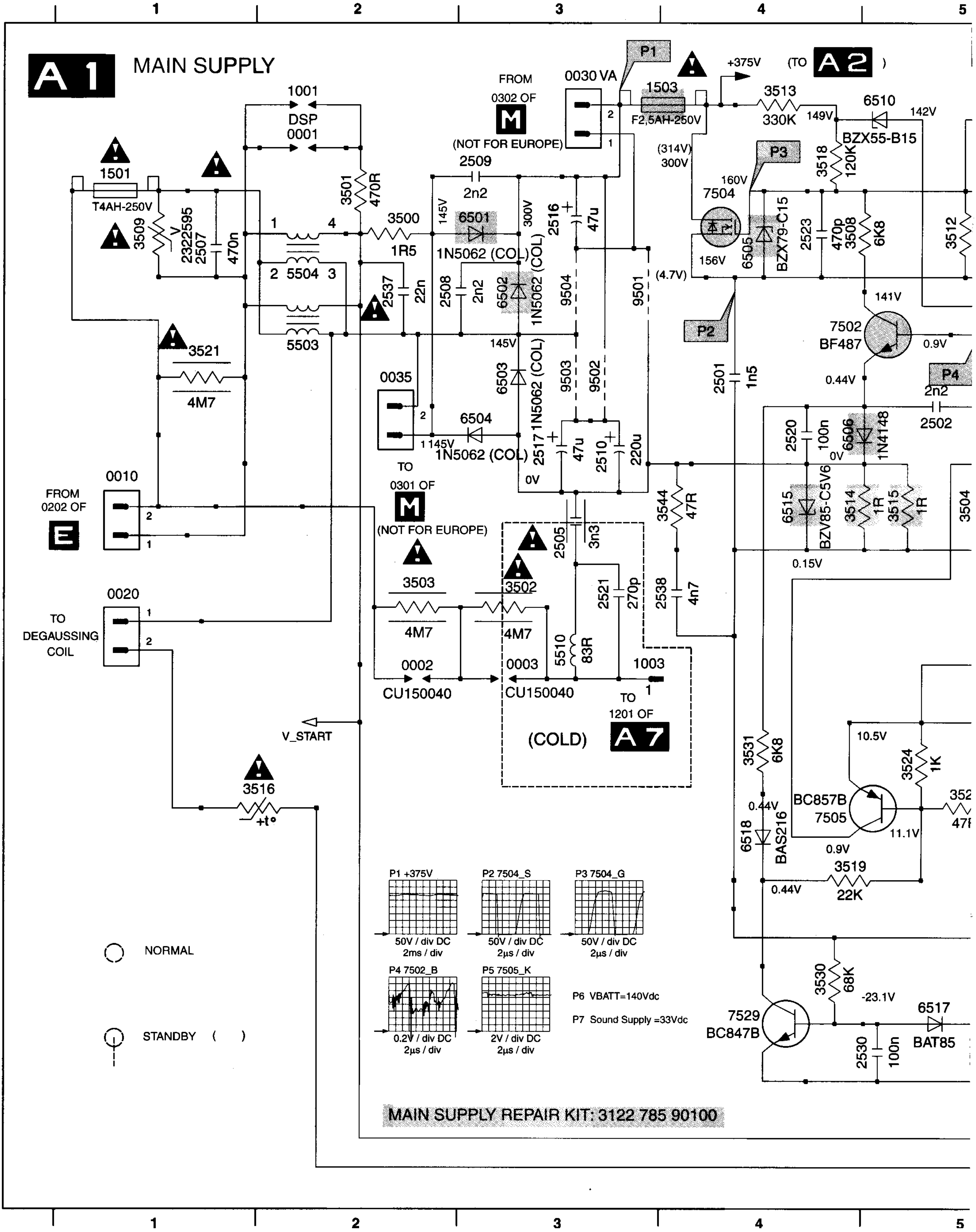
Testpoint overview CRT panel

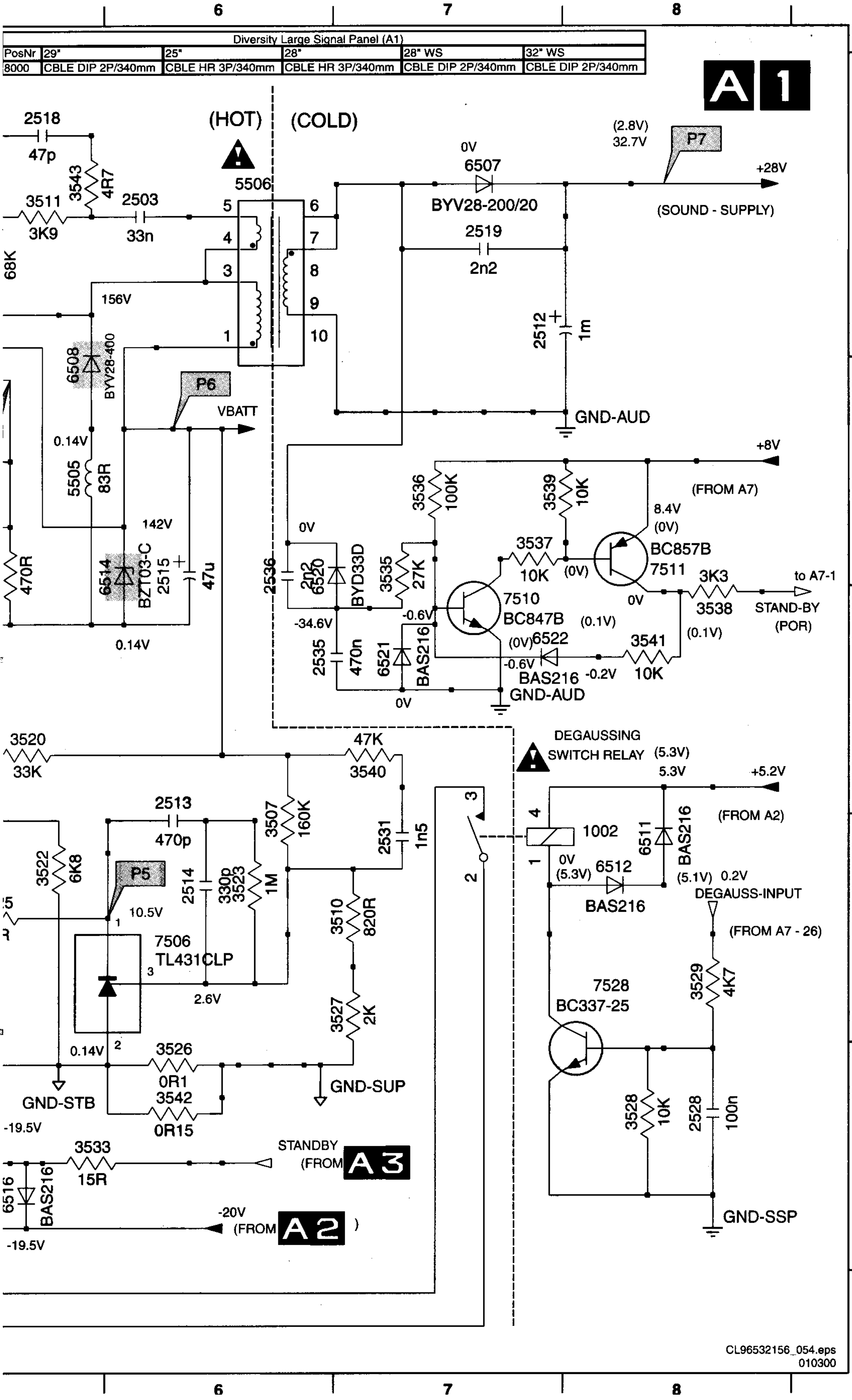

8
11
6
3306
3317
3310

CL 96532156_087.eps
280200

7. Schematics and PWB's

Main supply


A1 MAIN SUPPLY
1
2
3
4
5
1001
DSP
0001
1501
T4AH-250V
3509
V 2322595
2507
470n
1
4
2 5504 3
5503
3501
470R
3500
1R5
2537
22n
145V
2509
2n2
6501
1N5062 (COL)
300V
2508
2n2
6502
1N5062 (COL)
2516
47u
9504
9501
FROM
0302 OF
M
(NOT FOR EUROPE)
0030 VA
P1
1503
F2,5AH-250V
+375V
(TO A2)
3513
330K
149V
6510
142V
BZX55-B15
(314V)
300V
3518
120K
P3
160V
7504
156V
6505
BZX79-C15
2523
470p
3508
6K8
3512
(4.7V)
P2
141V
7502
BF487
0.9V
P4
0.44V
2n2
2502
2501
1n5
2520
100n
6506
1N4148
0V
6515
BZV85-C5V6
3514
1R
3515
1R
3504
0.15V
3521
4M7
145V
6503
1N5062 (COL)
9503
9502
0035
6504
1N5062 (COL)
1 145V
2
2517
47u
2510
220u
0V
TO
0301 OF
M
(NOT FOR EUROPE)
3544
47R
2538
4n7
FROM
0202 OF
E
0010
2
1
2505
3n3
2521
270p
5510
83R
0020
TO
DEGAUSSING
COIL
1
2
3503
4M7
3502
4M7
0002
CU150040
0003
CU150040
1003
TO
1201 OF
A7
(COLD)
V_START
3516
+t°
3531
6K8
0.44V
6518
BAS216
BC857B
7505
10.5V
3524
1K
352
47
11.1V
0.9V
3519
22K
0.44V
3530
68K
-23.1V
7529
BC847B
6517
BAT85
2530
100n
P1 +375V
50V / div DC
2ms / div
P2 7504_S
50V / div DC
2μs / div
P3 7504_G
50V / div DC
2μs / div
P4 7502_B
0.2V / div DC
2μs / div
P5 7505_K
2V / div DC
2μs / div
P6 VBATT=140Vdc
P7 Sound Supply =33Vdc
NORMAL
STANDBY ( )
MAIN SUPPLY REPAIR KIT: 3122 785 90100

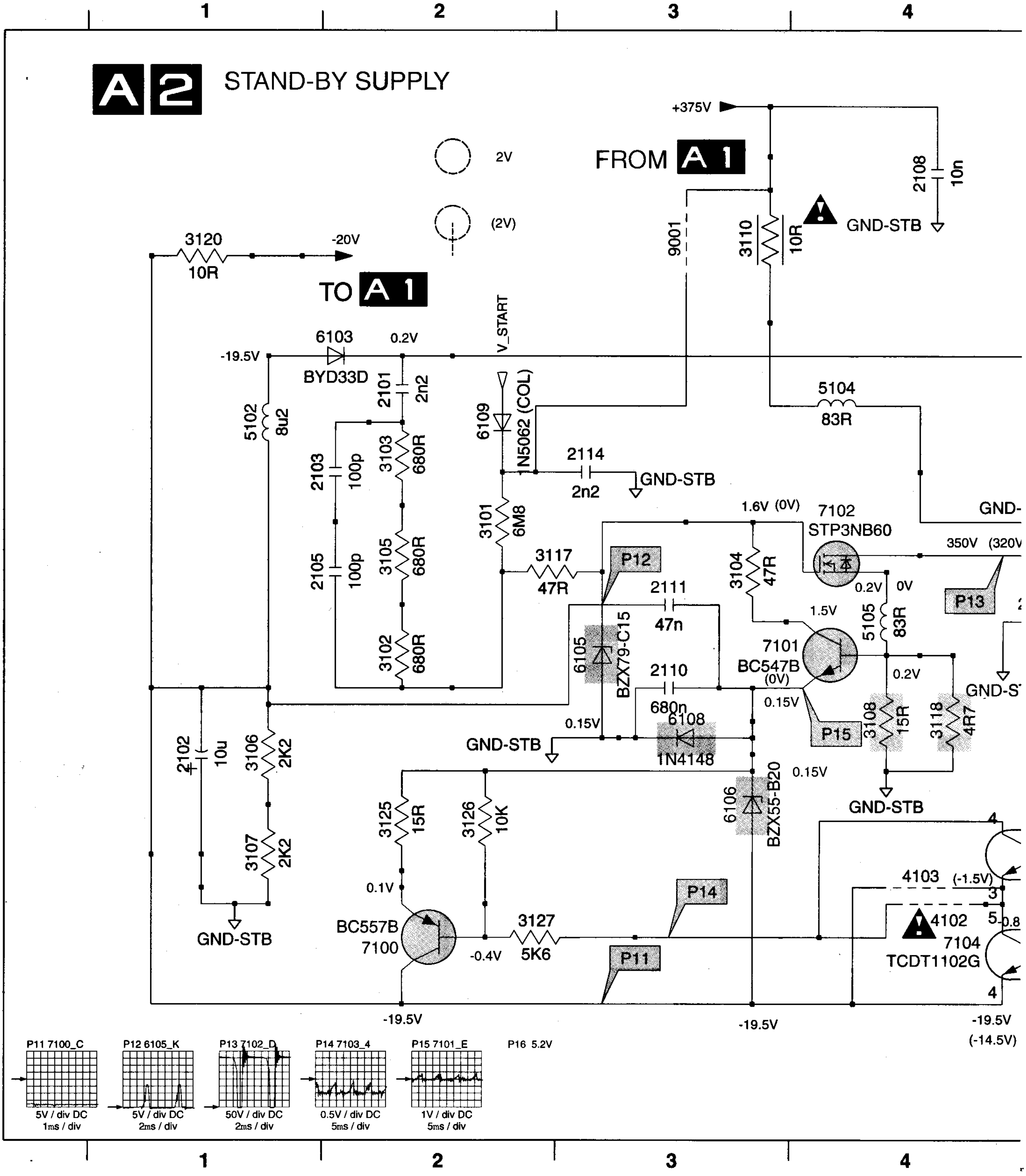

6
7
8
A1
(HOT)
(COLD)
2518
47p
3543
4R7
3511
3K9
2503
33n
68K
5506
5
4
3
1
6
7
8
9
10
156V
6508
BYV28-400
P6
VBATT
0.14V
5505
83R
142V
6514
BZT03-C
2515
47u
470R
0.14V
0V
6507
BYV28-200/20
(2.8V)
32.7V
P7
+28V
(SOUND - SUPPLY)
2519
2n2
2512
1m
GND-AUD
+8V
(FROM A7)
3536
100K
3539
10K
8.4V
(0V)
BC857B
7511
3537
10K
(0V)
3K3
3538
to A7-1
STAND-BY
(POR)
0V
2536
2n2
6520
BYD33D
3535
27K
7510
BC847B
-0.6V
-34.6V
(0.1V)
(0.1V)
2535
470n
6521
BAS216
(0V)6522
BAS216
-0.6V
-0.2V
3541
10K
0V
GND-AUD
3520
33K
47K
3540
2513
470p
3507
160K
2531
1n5
3522
6K8
P5
10.5V
2514
330p
3523
1M
7506
TL431CLP
1
2
3
2.6V
3510
820R
3527
2K
0.14V
3526
0R1
3542
0R15
GND-STB
GND-SUP
-19.5V
3533
15R
STANDBY
(FROM A3
6516
BAS216
-20V
(FROM A2)
-19.5V
DEGAUSSING
SWITCH RELAY
(5.3V)
5.3V
+5.2V
(FROM A2)
3
4
1002
1
2
6511
BAS216
0V
(5.3V)
6512
BAS216
(5.1V)
0.2V
DEGAUSS-INPUT
(FROM A7 - 26)
7528
BC337-25
3529
4K7
3528
10K
2528
100n
GND-SSP
A
B
C
D
E
CL96532156_054.eps
010300

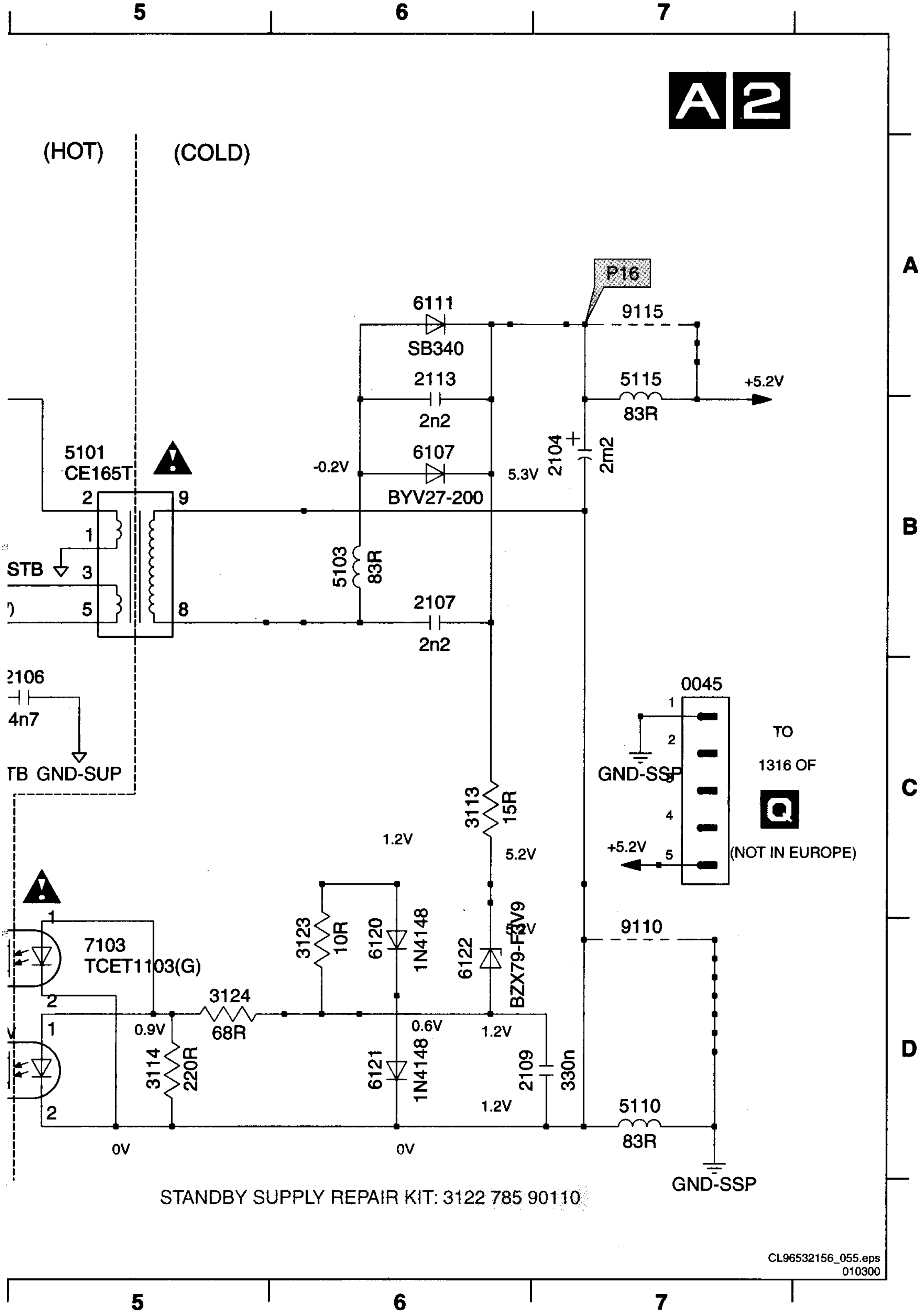
Diversity Large Signal Panel (A1)					
PosNr	29"	25"	28"	28" WS	32" WS
8000	CBLE DIP 2P/340mm	CBLE HR 3P/340mm	CBLE HR 3P/340mm	CBLE DIP 2P/340mm	CBLE DIP 2P/340mm

0001	A2
0002	C2
0003	C3
0010	B1
0020	C1
0030	A3
0035	B2
1001	A2
1002	D8
1003	C4
1501	A1
1503	A4
2501	B4
2502	B5
2503	A6
2505	C3
2507	A1
2508	A2
2509	A3
2510	B3
2512	A7
2513	C6
2514	D6
2515	B6
2516	A3
2517	B3
2518	A5
2519	A7
2520	B4
2521	C3
2523	A4
2528	E8
2530	E5
2531	D7
2535	C6
2536	B6
2537	A2
2538	C4
3500	A2
3501	A2
3502	C3
3503	C2
3504	B5
3507	D6
3508	A4
3509	A1
3510	D7
3511	A5
3512	A5
3513	A4
3514	B4
3515	B5
3516	D2
3518	A4
3519	D4
3520	C5
3521	B1
3522	D5
3523	D6
3524	D5
3525	D5
3526	E6
3527	D7
3528	E8
3529	D8
3530	E4
3531	D4
3533	E5
3535	B7
3536	B7
3537	B7
3538	C8
3539	B7
3540	C7
3541	C8
3542	E6
3543	A5
3544	B4
5503	B2
5504	A2
5505	B5
5506	A6
5510	C3
6501	A3
6502	A3
6503	B3
6504	B3
6505	A4
6506	B4
6507	A7
6508	B5
6510	A5
6511	D8
6512	D8
6514	B6
6515	B4
6516	E5
6517	E5
6518	D4
6520	B6
6521	C7
6522	C7
7502	B5
7504	A4
7505	D4
7506	D6
7510	C7
7511	B8
7528	D8
7529	E4
9501	A3
9502	B3
9503	B3
9504	A3

Standby supply

0045 C7	2107 B6	3101 B2	3108 C4	3123 D6	5101 B5	6103 A2	6120 D6	7104 D4
2101 B2	2108 A4	3102 C2	3110 A3	3124 D5	5102 B1	6105 C3	6121 D6	9001 A3
2102 C1	2109 D7	3103 B2	3113 C6	3125 D2	5103 B6	6106 C3	6122 D6	9110 D7
2103 B2	2110 C3	3104 B3	3114 D5	3126 D2	5104 B4	6107 B6	7100 D2	
2104 B7	2111 C3	3105 B2	3117 B2	3127 D2	5105 C4	6108 C3	7101 C4	
2105 B2	2113 A6	3106 C1	3118 C4	4102 D4	5110 D7	6109 B2	7102 B4	
2106 C5	2114 B3	3107 D1	3120 A1	4103 D4	5115 A7	6111 A6	7103 D5	


1
2
3
4
A2 STAND-BY SUPPLY
2V
(2V)
+375V
FROM A1
2108
10n
9001
3110
10R
GND-STB
3120
10R
-20V
TO A1
V_START
6103
BYD33D
0.2V
-19.5V
2101
2n2
5102
8u2
2103
100p
3103
680R
6109
1N5062 (COL)
2114
2n2
GND-STB
5104
83R
2105
100p
3105
680R
3101
6M8
3117
47R
P12
1.6V (0V)
7102
STP3NB60
350V (320V)
3104
47R
0.2V
0V
P13
2111
47n
1.5V
5105
83R
3102
680R
6105
BZX79-C15
7101
BC547B
(0V)
2110
680n
0.2V
GND-S
0.15V
0.15V
6108
1N4148
P15
3108
15R
3118
4R7
GND-STB
2102
10u
3106
2K2
0.15V
6106
BZX55-B20
GND-STB
3125
15R
3126
10K
3107
2K2
0.1V
4103
(-1.5V)
P14
3
4102
5
0.8
BC557B
7100
3127
5K6
7104
TCDT1102G
GND-STB
-0.4V
P11
4
-19.5V
-19.5V
-19.5V
(-14.5V)
P11 7100_C
5V / div DC
1ms / div
P12 6105_K
5V / div DC
2ms / div
P13 7102_D
50V / div DC
2ms / div
P14 7103_4
0.5V / div DC
5ms / div
P15 7101_E
1V / div DC
5ms / div
P16 5.2V
1
2
3
4

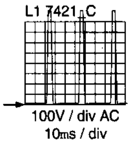

A2
(HOT)
(COLD)
5101
CE165T
2
1
STB
3
5
9
8
2106
4n7
TB GND-SUP
6111
SB340
2113
2n2
6107
BYV27-200
-0.2V
5.3V
5103
83R
2107
2n2
P16
9115
5115
83R
+5.2V
2104
2m2
0045
1
2
3
4
5
GND-SSP
TO
1316 OF
Q
(NOT IN EUROPE)
+5.2V
3113
15R
5.2V
1.2V
6122
BZX79-F5V9
5.2V
7103
TCET1103(G)
1
2
1
2
3124
68R
0.9V
3114
220R
3123
10R
6120
1N4148
6121
1N4148
0.6V
1.2V
2109
330n
1.2V
0V
0V
9110
5110
83R
GND-SSP
5
6
7
A
B
C
D

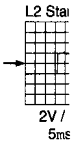
STANDBY SUPPLY REPAIR KIT: 3122 785 90110

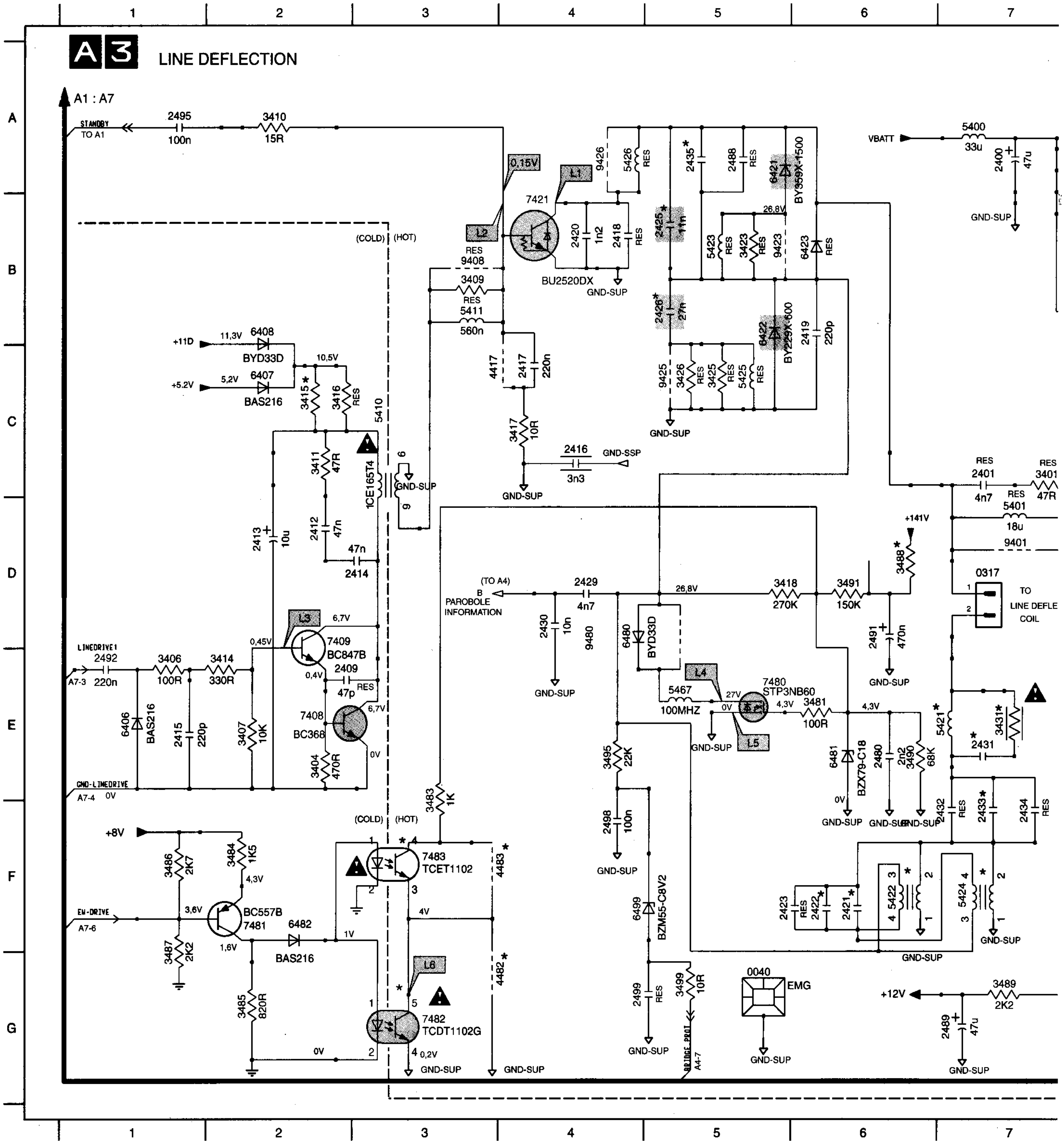
CL96532156_055.eps
010300

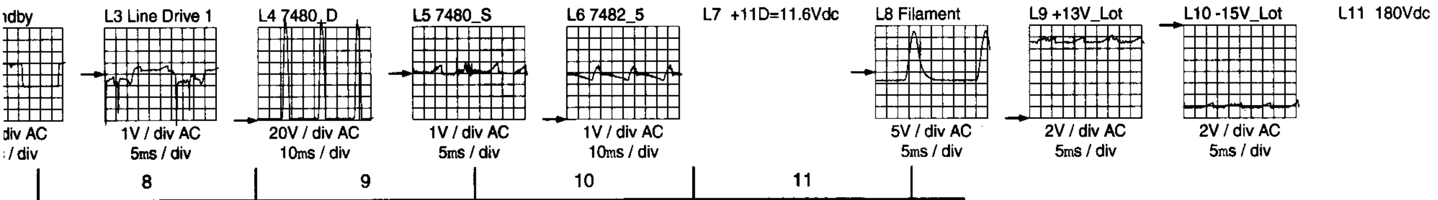
Line deflection

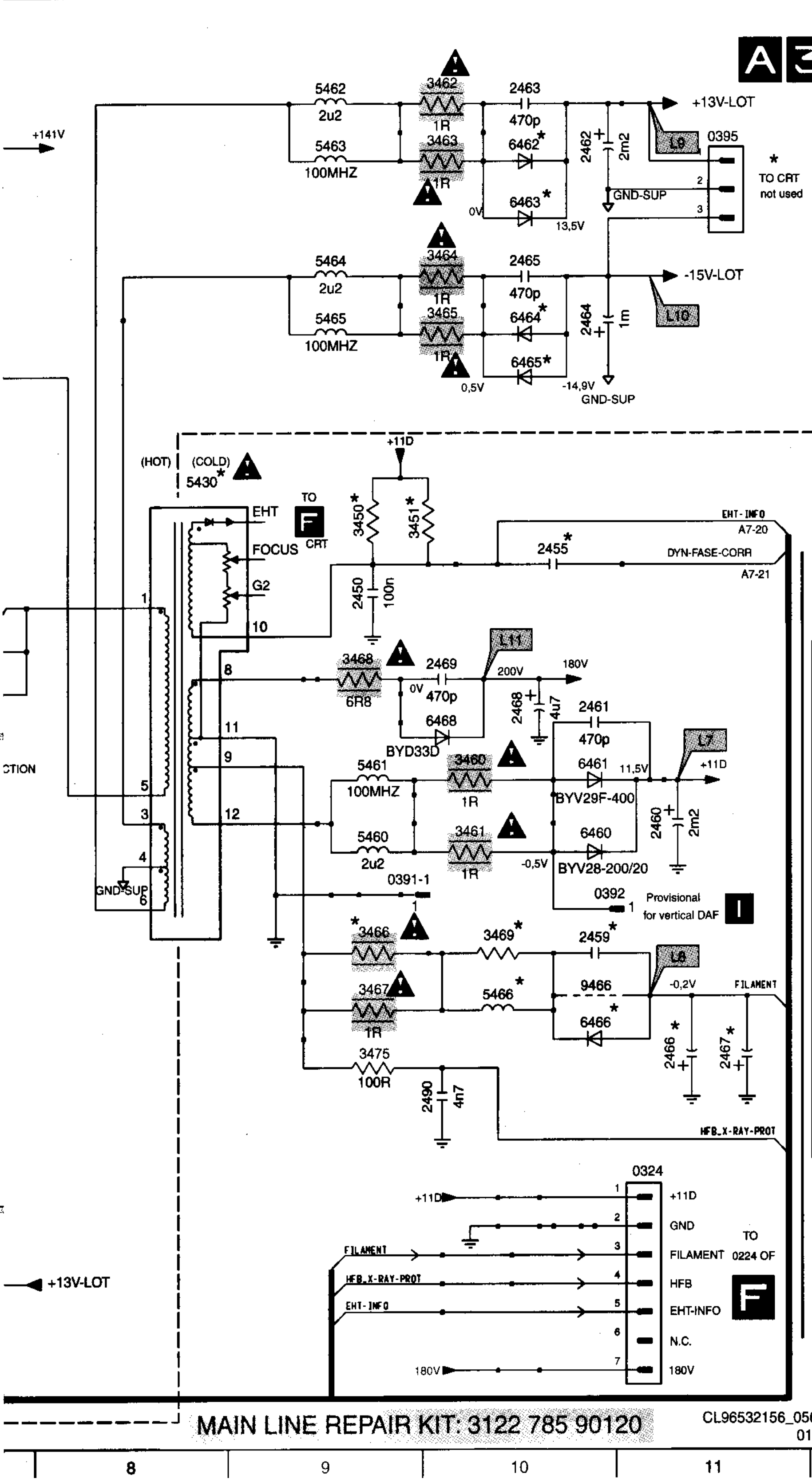
2400 A7	2421 F6	2450 C9	2469 D10	3406 E1	3426 C5	3468 D9	3491 D6	5423 B5	5467 E5	6465 B10	7482 G3
2401 C7	2422 F6	2455 C10	2480 E6	3407 E2	3431 E7	3469 E10	3495 E4	5424 F7	6406 E1	6466 F10	7483 F3
2409 E2	2423 F5	2459 E10	2488 A5	3409 B3	3450 C9	3475 F9	3499 G5	5425 C5	6407 C2	6468 D10	9401 D7
2412 D2	2425 B5	2460 D11	2489 G7	3410 A2	3451 C9	3481 E6	4417 C3	5426 A4	6408 B2	6480 D4	9408 B3
2413 D2	2426 B5	2461 D10	2490 F10	3411 C2	3460 D10	3483 F3	4482 G3	5430 C8	6421 A5	6481 E6	9423 B5
2414 D3	2429 D4	2462 A10	2491 D6	3414 E2	3461 E10	3484 F2	4483 F3	5460 E9	6422 B5	6482 F2	9425 C5






1
2
3
4
5
6
7
A
B
C
D
E
F
G
A3
LINE DEFLECTION
A1 : A7
STANDBY
TO A1
2495
100n
3410
15R
0,15V
L1
L2
7421
BU2520DX
2420
1n2
2418
RES
GND-SUP
9426
5426
RES
2435*
2488
RES
6421
BY359X-1500
26,8V
2425*
11n
5423
RES
3423
RES
9423
6423
RES
2426*
27n
6422
BY229X-600
2419
220p
9425
3426
RES
3425
RES
5425
RES
GND-SUP
VBATT
5400
33u
2400
47u
GND-SUP
(COLD)
(HOT)
RES
9408
3409
RES
5411
560n
4417
2417
220n
3417
10R
2416
3n3
GND-SSP
GND-SUP
+11D
11,3V
6408
BYD33D
+5.2V
5,2V
6407
BAS216
10,5V
3415*
3416
RES
5410
3411
47R
1CE165T4
GND-SUP
2413
10u
2412
47n
47n
2414
L3
6,7V
0,45V
7409
BC847B
2409
47p
RES
0,4V
7408
BC368
6,7V
0V
3404
470R
LINEDRIVE1
A7-3
2492
220n
3406
100R
3414
330R
6406
BAS216
2415
220p
3407
10K
GND-LINEDRIVE
A7-4
0V
(TO A4)
B
PAROBOLE
INFORMATION
2429
4n7
2430
10n
9480
GND-SUP
26,8V
6480
BYD33D
3418
270K
3491
150K
+141V
3488*
2491
470n
GND-SUP
L4
5467
100MHZ
27V
0V
7480
STP3NB60
4,3V
3481
100R
4,3V
GND-SUP
L5
3495
22K
2498
100n
GND-SUP
6481
BZX79-C18
0V
GND-SUP
2480
2n2
3490
68K
GND-SUP
GND-SUP
RES
2401
4n7
RES
3401
47R
RES
5401
18u
9401
0317
TO
LINE DEFLE
COIL
5421*
3431*
2431*
2432
RES
2433*
2434
RES
+8V
3486
2K7
3484
1K5
4,3V
EW-DRIVE
A7-6
3,6V
BC557B
7481
6482
BAS216
1,6V
1V
3487
2K2
3485
820R
3483
1K
(COLD)
(HOT)
7483
TCET1102
4483*
4V
L6
4482*
7482
TCDT1102G
0V
0,2V
GND-SUP
GND-SUP
6499
BZM55-C8V2
2499
RES
3499
10R
BRIDGE PROT
A4-7
GND-SUP
0040
EMG
GND-SUP
2423
RES
2422*
2421*
5422
5424
GND-SUP
GND-SUP
+12V
3489
2K2
2489
47u
GND-SUP



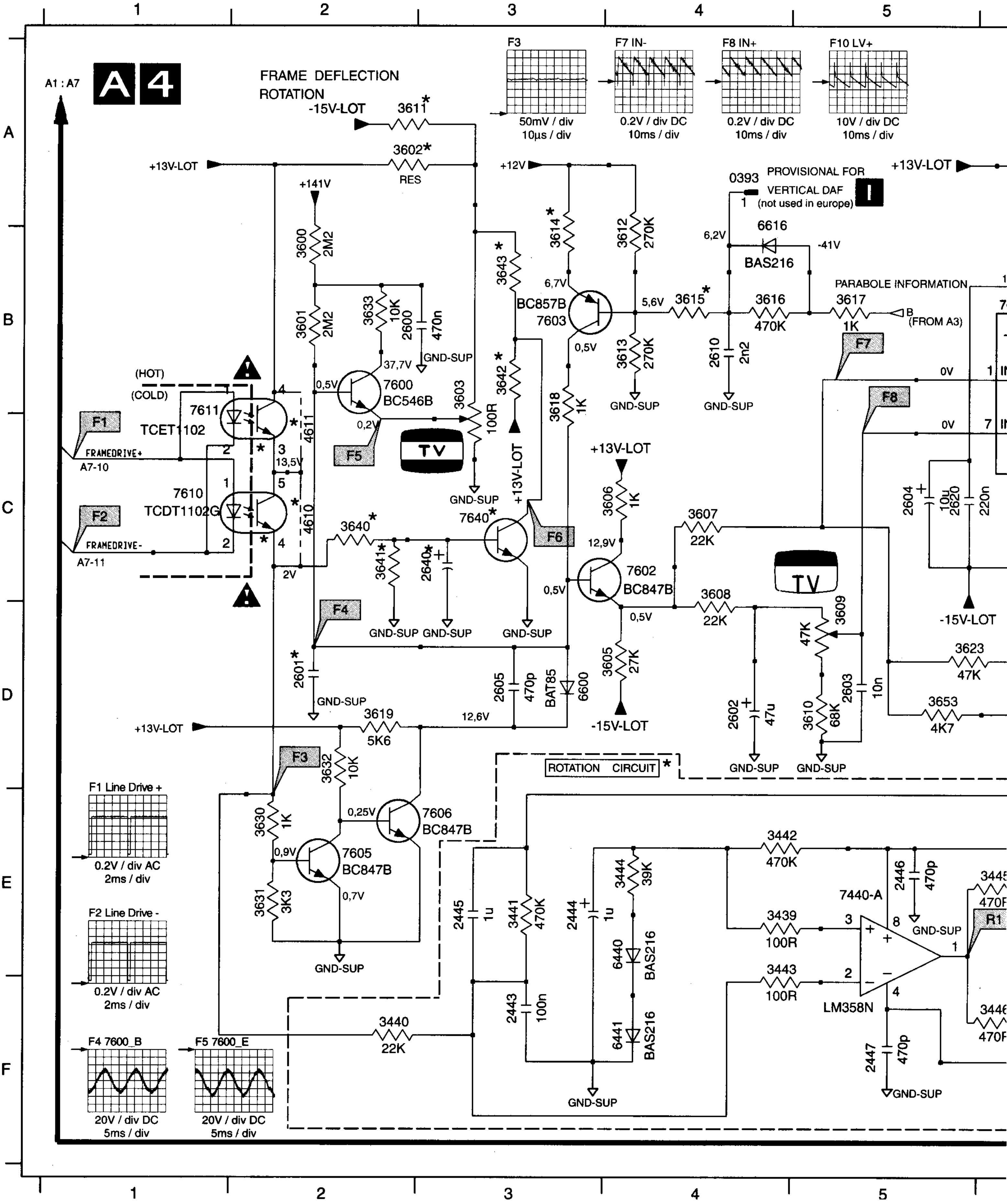

A3
A
B
C
+141V
5462
2u2
5463
100MHZ
3462
1R
3463
1R
2463
470p
6462*
6463*
0V
13,5V
2462
2m2
+13V-LOT
L9
0395
1
2
3
TO CRT
not used
GND-SUP
5464
2u2
5465
100MHZ
3464
1R
3465
1R
2465
470p
6464*
6465*
0,5V
-14,9V
2464
1m
-15V-LOT
L10
GND-SUP
(HOT)
(COLD)
5430*
EHT
FOCUS
G2
TO
F
CRT
1
10
8
11
9
12
5
3
4
6
GND-SUP
+11D
3450*
3451*
2450
100n
2455*
EHT-INFO
A7-20
DYN-FASE-CORR
A7-21
3468
6R8
2469
470p
0V
6468
BYD33D
L11
200V
180V
2468
4u7
2461
470p
5461
100MHZ
3460
1R
6461
BYV29F-400
11,5V
L7
+11D
2460
2m2
5460
2u2
3461
1R
-0,5V
6460
BYV28-200/20
0391-1
0392
1
Provisional
for vertical DAF
I
3466*
3469*
2459*
L8
3467
1R
5466*
9466
-0,2V
FILAMENT
6466*
2466*
2467*
3475
100R
2490
4n7
HFB_X-RAY-PROT
0324
+11D
1
+11D
2
GND
FILAMENT
3
FILAMENT
HFB_X-RAY-PROT
4
HFB
EHT-INFO
5
EHT-INFO
6
N.C.
180V
7
180V
TO
0224 OF
F
CTION
+13V-LOT
8
9
10
11

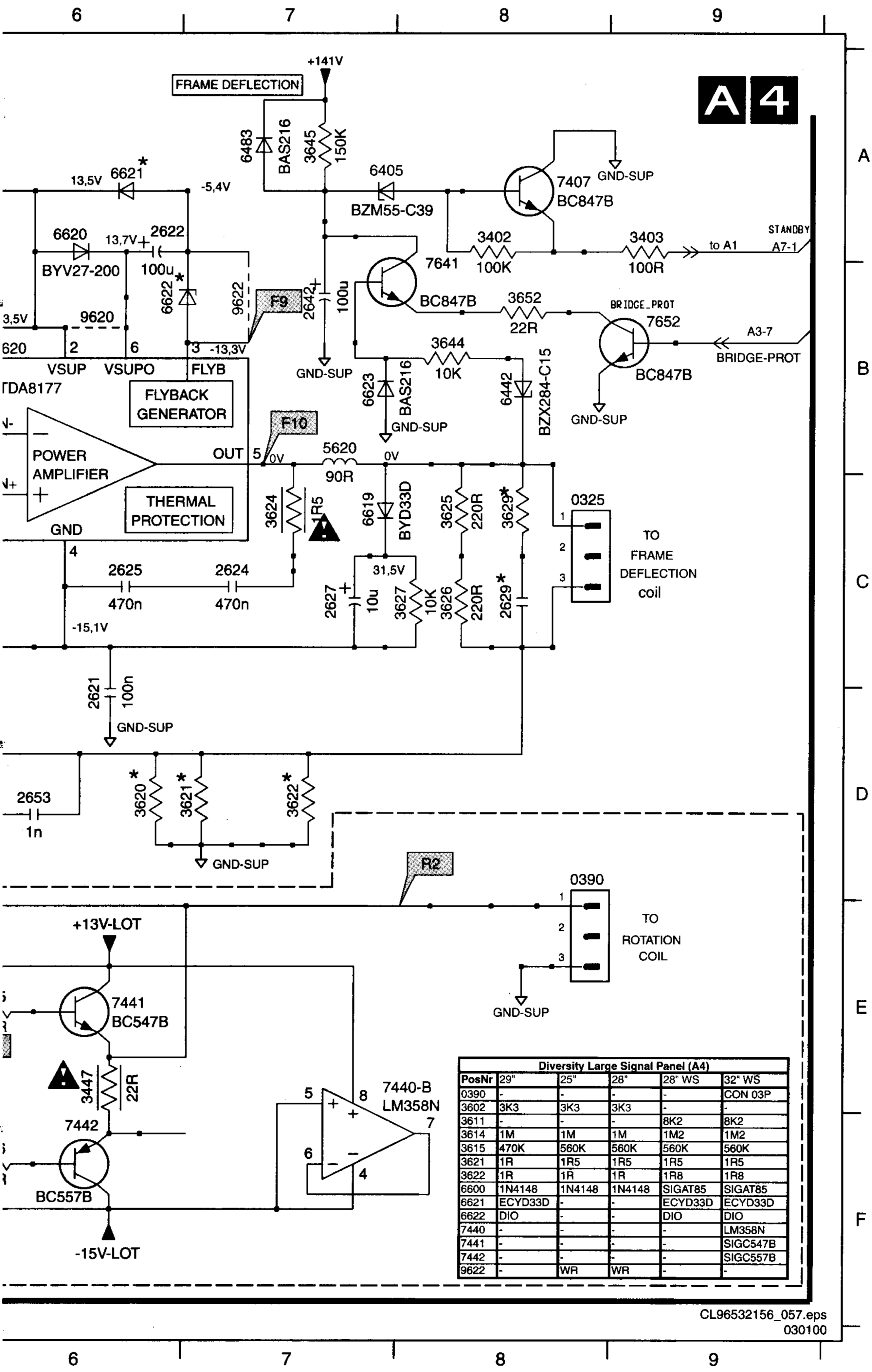
MAIN LINE REPAIR KIT: 3122 785 90120

CL96532156_056.eps
010300

Diversity Large Signal Panel (A3)					
PosNr	*29"*	*25"*	*28"*	*28" WS*	*32" WS*
2420	1N	1N	1N	560P	1N
2421	560N	560N	470N	-	-
2422	-	-	-	21U2	21U2
2425	10N	9N1	-	11N	11N
2426	22N	24N	24N	24N	24N
2431	6N8	3N3	3N3	3N3	3N3
2433	560N	390N	470N	390N	430N
2435	-	-	9N1	-	-
2455	1N	-	-	3N3	3N3
3415	3W 15R	3W 15R	3W 15R	PR03 12R	PR03 12R
3431	100R	220R	220R	220R	220R
3450	6K8	-	-	10K	10K
3450	-	8K2	8K2	-	-
3451	22K	22K	22K	10K	10K
3466	FUSE 8R2	6R8	FUSE 8R2	1R	1R
3488	330K	220K	220K	220K	120K
5421	COI LINCOR DRUM	COI LINCOR DC12 8MH	COI LINCOR DRUM	COI LINCOR DRUM	COI LINCOR DRUM
5422	COI BRIDGE	-	-	COI BRIDGE	COI BRIDGE
5424	-	COI BRIDGE	COI BRIDGE	-	-
5430	LOT 30KV ISO ELDOR	LOT PWRSL. 27K5	LOT PWRSL. 27K5	LOT PWRSL. 30KV	LOT PWRSL. 30KV
2445	-	-	-	-	1U
2446	-	-	-	-	470P
2447	-	-	-	-	470P
3439	-	-	-	-	100R
3440	-	-	-	-	22K
3441	-	-	-	-	470K
3442	-	-	-	-	470K
3443	-	-	-	-	100R
3444	-	-	-	-	39K
3445	-	-	-	-	2K2
3446	-	-	-	-	2K2
3447	-	-	-	-	22R
4441	-	-	-	-	JUMP
6440	-	-	-	-	SMAS216
6441	-	-	-	-	SMAS216

Frame deflection

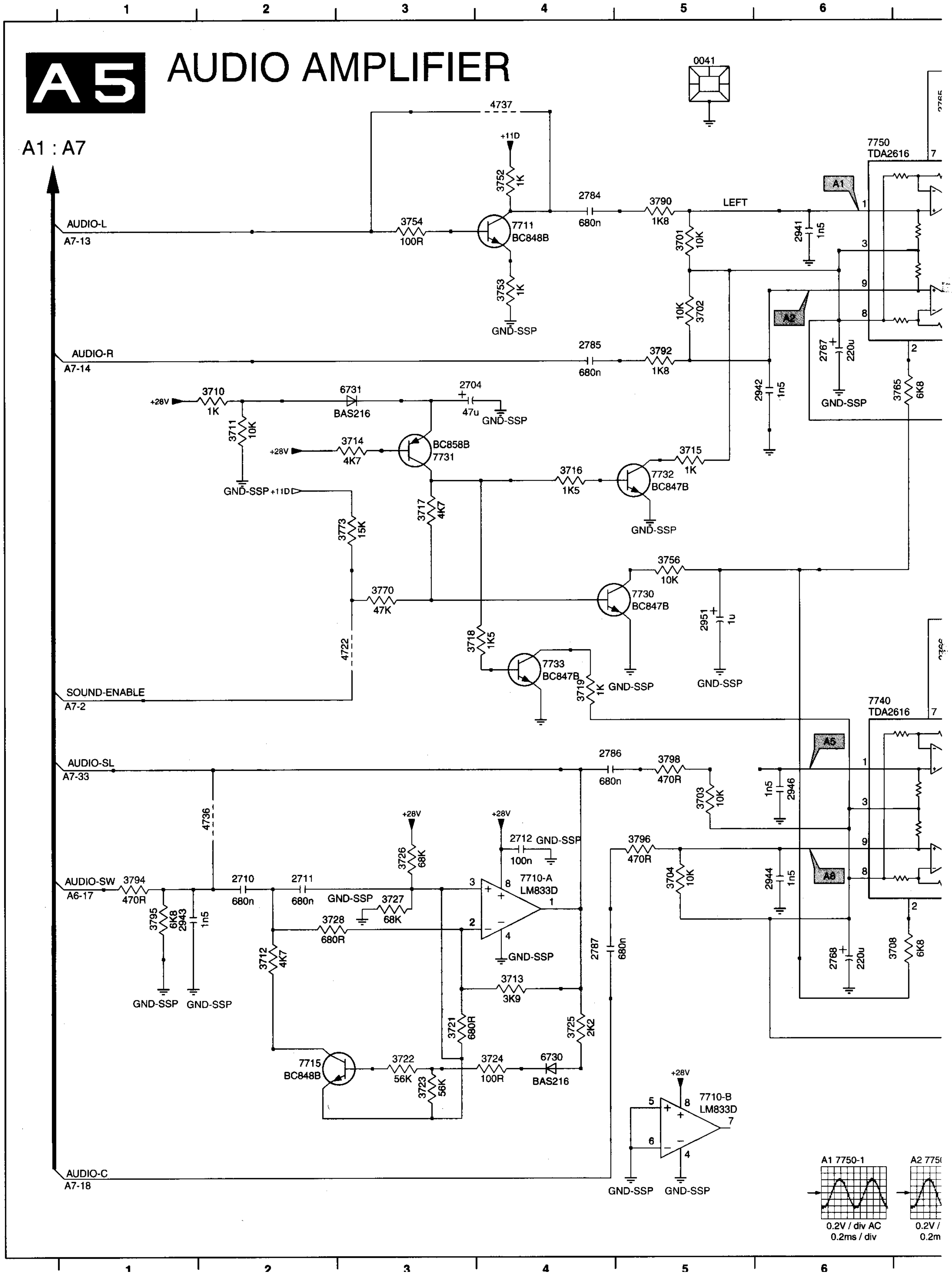

1
2
3
4
5
A
B
C
D
E
F
A1 : A7
A4
FRAME DEFLECTION
ROTATION
-15V-LOT
3611*
3602*
RES
+13V-LOT
+141V
3600 2M2
3601 2M2
3633 10K
2600 470n
37,7V
GND-SUP
0,5V
7600
BC546B
0,2V
F5
3603 100R
TV
GND-SUP
F3
50mV / div
10μs / div
F7 IN-
0.2V / div DC
10ms / div
F8 IN+
0.2V / div DC
10ms / div
F10 LV+
10V / div DC
10ms / div
+12V
3614*
3612 270K
6,7V
BC857B
7603
5,6V
3615*
0,5V
3613 270K
GND-SUP
3618 1K
3643*
3642*
+13V-LOT
0393
1
PROVISIONAL FOR
VERTICAL DAF
(not used in europe)
I
6,2V
6616
BAS216
-41V
3616
470K
2610 2n2
PARABOLE INFORMATION
3617
1K
B
(FROM A3)
F7
F8
0V
1
0V
7
(HOT)
(COLD)
7611
TCET1102
F1
FRAMEDRIVE+
A7-10
7610
TCDT1102G
F2
FRAMEDRIVE-
A7-11
4611
4610
13,5V
2V
3640*
3641*
2640*
7640*
F6
GND-SUP
GND-SUP
GND-SUP
F4
2601*
GND-SUP
2605 470p
BAT85
6600
+13V-LOT
3606 1K
12,9V
7602
BC847B
0,5V
3607
22K
3608
22K
3605 27K
-15V-LOT
TV
3609 47K
2602 47u
3610 68K
2603 10n
GND-SUP
GND-SUP
2604 10u
2620 220n
-15V-LOT
3623
47K
3653
4K7
+13V-LOT
3619
5K6
12,6V
ROTATION CIRCUIT *
F3
3632 10K
3630 1K
0,25V
7606
BC847B
0,9V
7605
BC847B
3631 3K3
0,7V
GND-SUP
F1 Line Drive +
0.2V / div AC
2ms / div
F2 Line Drive -
0.2V / div AC
2ms / div
F4 7600_B
20V / div DC
5ms / div
F5 7600_E
20V / div DC
5ms / div
3440
22K
2445 1u
3441 470K
2443 100n
2444 1u
3444 39K
6440 BAS216
6441 BAS216
GND-SUP
3442
470K
3439
100R
3443
100R
7440-A
LM358N
2446 470p
GND-SUP
2447 470p
GND-SUP
R1
3445
470R
3446
470R

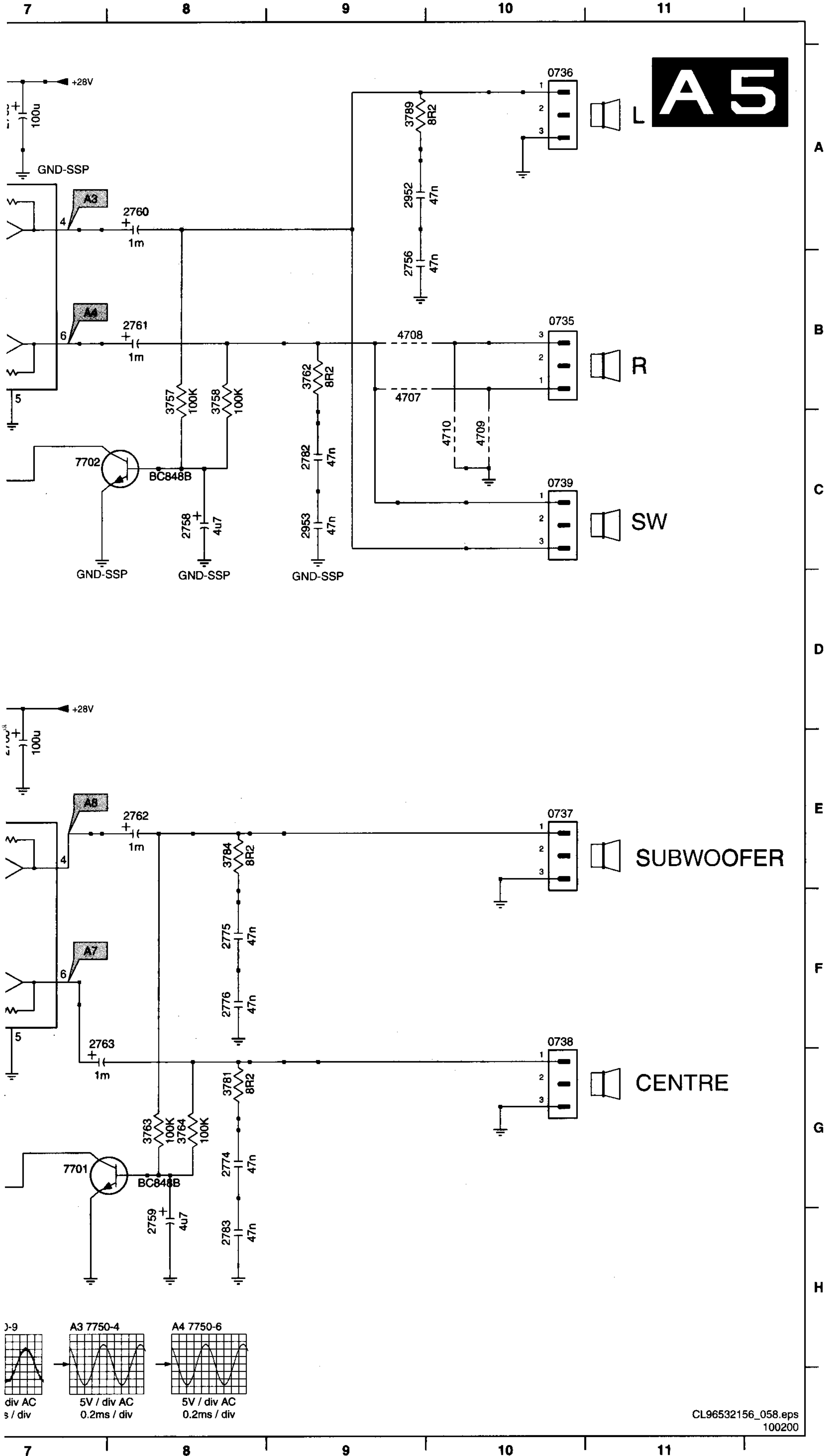

6
7
8
9
A4
A
B
C
D
E
F
+141V
FRAME DEFLECTION
6483
BAS216
3645
150K
6621
13,5V
-5,4V
6405
BZM55-C39
7407
BC847B
GND-SUP
6620
BYV27-200
13,7V
2622
100u
6622
9622
F9
3,5V
9620
620
2
6
3
-13,3V
VSUP
VSUPO
FLYB
TDA8177
FLYBACK GENERATOR
POWER AMPLIFIER
THERMAL PROTECTION
OUT
5
GND
4
2642
100u
7641
BC847B
3402
100K
3403
100R
to A1
STANDBY
A7-1
3652
22R
BRIDGE_PROT
7652
BC847B
A3-7
BRIDGE-PROT
3644
10K
6623
BAS216
6442
BZX284-C15
F10
0V
5620
90R
3624
1R5
6619
BYD33D
3625
220R
3629
0325
1
2
3
TO FRAME DEFLECTION coil
2625
470n
2624
470n
31,5V
2627
10u
3627
10K
3626
220R
2629
-15,1V
2621
100n
2653
1n
3620
3621
3622
R2
0390
TO ROTATION COIL
+13V-LOT
7441
BC547B
3447
22R
7442
BC557B
-15V-LOT
7440-B
LM358N
5
8
7
6
4
CL96532156_057.eps
030100

Diversity Large Signal Panel (A4)					
PosNr	29"	25"	28"	28" WS	32" WS
0390	-	-	-	-	CON 03P
3602	3K3	3K3	3K3	-	-
3611	-	-	-	8K2	8K2
3614	1M	1M	1M	1M2	1M2
3615	470K	560K	560K	560K	560K
3621	1R	1R5	1R5	1R5	1R5
3622	1R	1R	1R	1R8	1R8
6600	1N4148	1N4148	1N4148	SIGAT85	SIGAT85
6621	ECYD33D	-	-	ECYD33D	ECYD33D
6622	DIO	-	-	DIO	DIO
7440	-	-	-	-	LM358N
7441	-	-	-	-	SIGC547B
7442	-	-	-	-	SIGC557B
9622	-	WR	WR	-	-

0325	C8
0390	D8
0393	A4
2443	F3
2444	E3
2445	E3
2446	E5
2447	F5
2600	B2
2601	D2
2602	D4
2603	D5
2604	C5
2605	D3
2610	B4
2620	C5
2621	D6
2622	A6
2624	C7
2625	C6
2627	C7
2629	C8
2640	C3
2642	B7
2653	D6
3402	A8
3403	A9
3439	E4
3440	F2
3441	E3
3442	E4
3443	E4
3444	E4
3445	E6
3446	F6
3447	E6
3600	B2
3601	B2
3602	A2
3603	B3
3605	D4
3606	C4
3607	C4
3608	C4
3609	D5
3610	D5
3611	A2
3612	B4
3613	B4
3614	B3
3615	B4
3616	B4
3617	B5
3618	B3
3619	D2
3620	D6
3621	D7
3622	D7
3623	D5
3624	C7
3625	C8
3626	C8
3627	C8
3629	C8
3630	E2
3631	E2
3632	D2
3633	B2
3640	C2
3641	C2
3642	B3
3643	B3
3644	B8
3645	A7
3652	B8
3653	D5
4610	C2
4611	C2
5620	B7
6405	A7
6440	E4
6441	F4
6442	B8
6483	A7
6600	D3
6616	B4
6619	C7
6620	A6
6621	A6
6622	B6
6623	B7
7407	A8
7440-A	E5
7440-B	E7
7441	E6
7442	F6
7600	B2
7602	C4
7603	B3
7605	E2
7606	E3
7610	C1
7611	C1
7620	B6
7640	C3
7641	B8
7652	B9
9620	B6

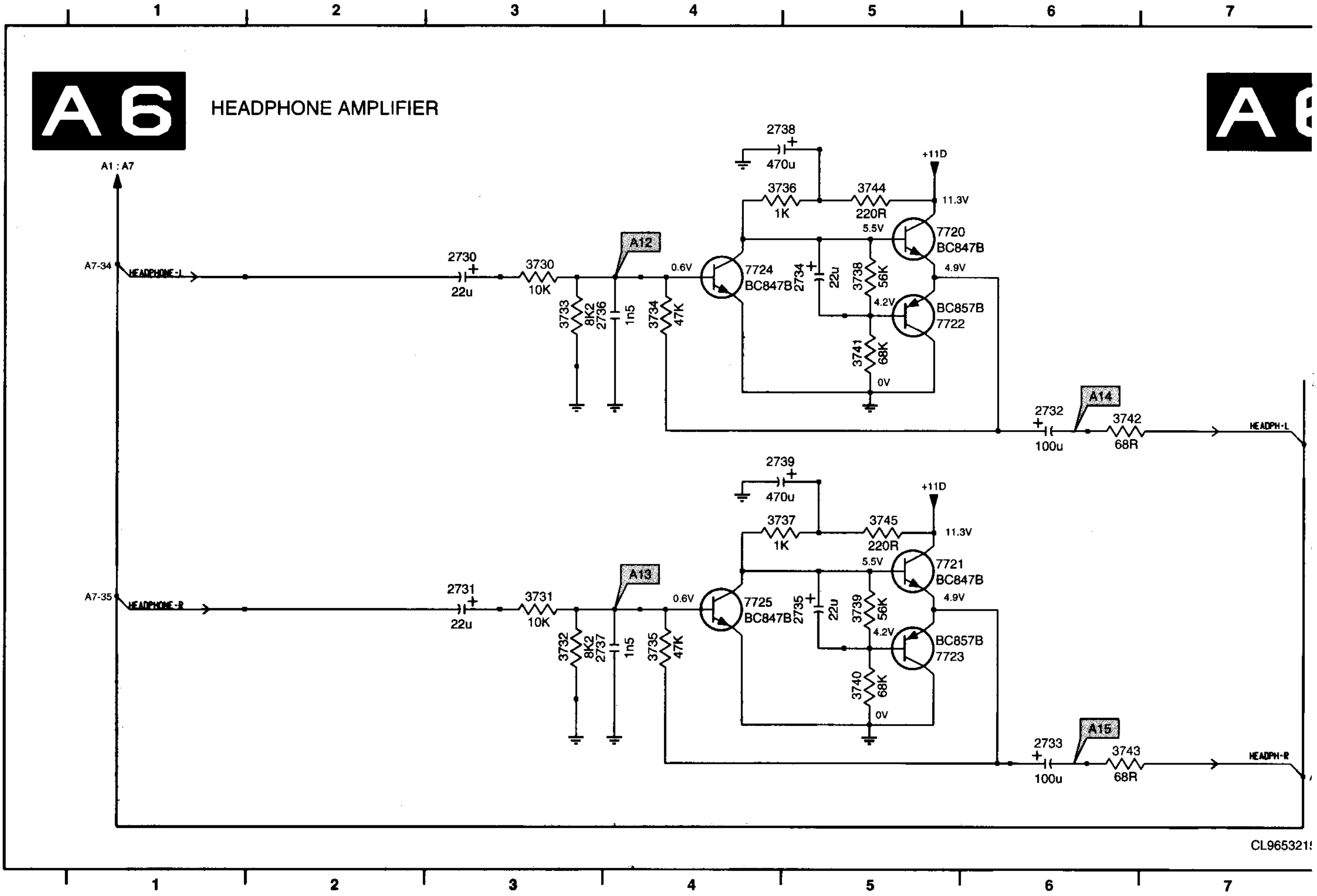
Audio amplifier


1
2
3
4
5
6
A5
AUDIO AMPLIFIER
A1 : A7
0041
4737
+11D
3752
1K
2784
680n
3790
1K8
LEFT
7750
TDA2616
A1
AUDIO-L
A7-13
3754
100R
7711
BC848B
2941
1n5
3701
10K
3753
1K
GND-SSP
10K
3702
A2
2767
220u
AUDIO-R
A7-14
2785
680n
3792
1K8
2942
1n5
3765
6K8
+28V
3710
1K
3711
10K
6731
BAS216
2704
47u
3714
4K7
BC858B
7731
3715
1K
3716
1K5
7732
BC847B
+11D
3773
15K
3717
4K7
3756
10K
3770
47K
7730
BC847B
2951
1u
3718
1K5
4722
7733
BC847B
3719
1K
SOUND-ENABLE
A7-2
7740
TDA2616
A5
AUDIO-SL
A7-33
2786
680n
3798
470R
3703
10K
2946
4736
3796
470R
3704
10K
2944
A6
2768
220u
3708
6K8
AUDIO-SW
A6-17
3794
470R
3795
6K8
2943
1n5
2710
680n
2711
680n
3726
68K
3727
68K
3728
680R
2712
100n
7710-A
LM833D
2787
680n
3712
4K7
3713
3K9
3721
680R
3725
2K2
7715
BC848B
3722
56K
3723
56K
3724
100R
6730
BAS216
7710-B
LM833D
AUDIO-C
A7-18
A1 7750-1
0.2V / div AC
0.2ms / div
A2 7750

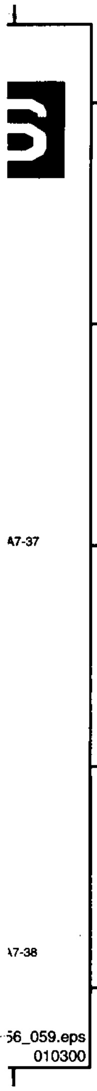

A5
7
8
9
10
11
A
B
C
D
E
F
G
H
+28V
100u
GND-SSP
A3
A4
4
6
5
2760
1m
2761
1m
0736
L
3789
8R2
2952
47n
2756
47n
0735
R
4708
4707
3762
8R2
3757
100K
3758
100K
4710
4709
7702
BC848B
2782
47n
0739
SW
2758
4u7
2953
47n
GND-SSP
GND-SSP
GND-SSP
+28V
100u
A8
2762
1m
0737
SUBWOOFER
3784
8R2
2775
47n
2776
47n
A7
2763
1m
0738
CENTRE
3781
8R2
3763
100K
3764
100K
7701
BC848B
2774
47n
2759
4u7
2783
47n
-9
div AC
s / div
A3 7750-4
5V / div AC
0.2ms / div
A4 7750-6
5V / div AC
0.2ms / div
CL96532156_058.eps
100200

0041	A5
0735	B10
0736	A10
0737	E10
0738	F10
0739	C10
2704	C3
2710	F2
2711	F2
2712	F4
2756	B9
2758	C8
2759	H8
2760	A8
2761	B8
2762	E8
2763	F7
2765	A7
2766	E7
2767	B6
2768	G6
2774	G8
2775	F8
2776	F8
2782	C9
2783	H8
2784	A4
2785	B4
2786	E4
2787	G4
2941	B6
2942	C6
2943	G1
2944	F6
2946	F6
2951	D5
2952	A9
2953	C9
3701	B5
3702	B5
3703	F5
3704	F5
3708	G7
3710	C2
3711	C2
3712	G2
3713	G4
3714	C3
3715	C5
3716	C4
3717	D3
3718	E3
3719	E4
3721	G3
3722	H3
3723	H3
3724	H4
3725	G4
3726	F3
3727	F3
3728	G2
3752	A4
3753	B4
3754	B3
3756	D5
3757	B8
3758	B8
3762	B9
3763	G8
3764	G8
3765	C7
3770	D3
3773	D3
3781	G8
3784	E8
3789	A9
3790	A5
3792	B5
3794	F1
3795	G1
3796	F5
3798	E5
4707	B9
4708	B9
4709	C10
4710	C10
4722	E3
4736	F2
4737	A4
6730	H4
6731	C3
7701	G7
7702	C7
7710-A	F4
7710-B	H5
7711	B4
7715	H2
7730	D5
7731	C3
7732	C5
7733	E4
7740	E6
7750	A6

Headphone amplifier

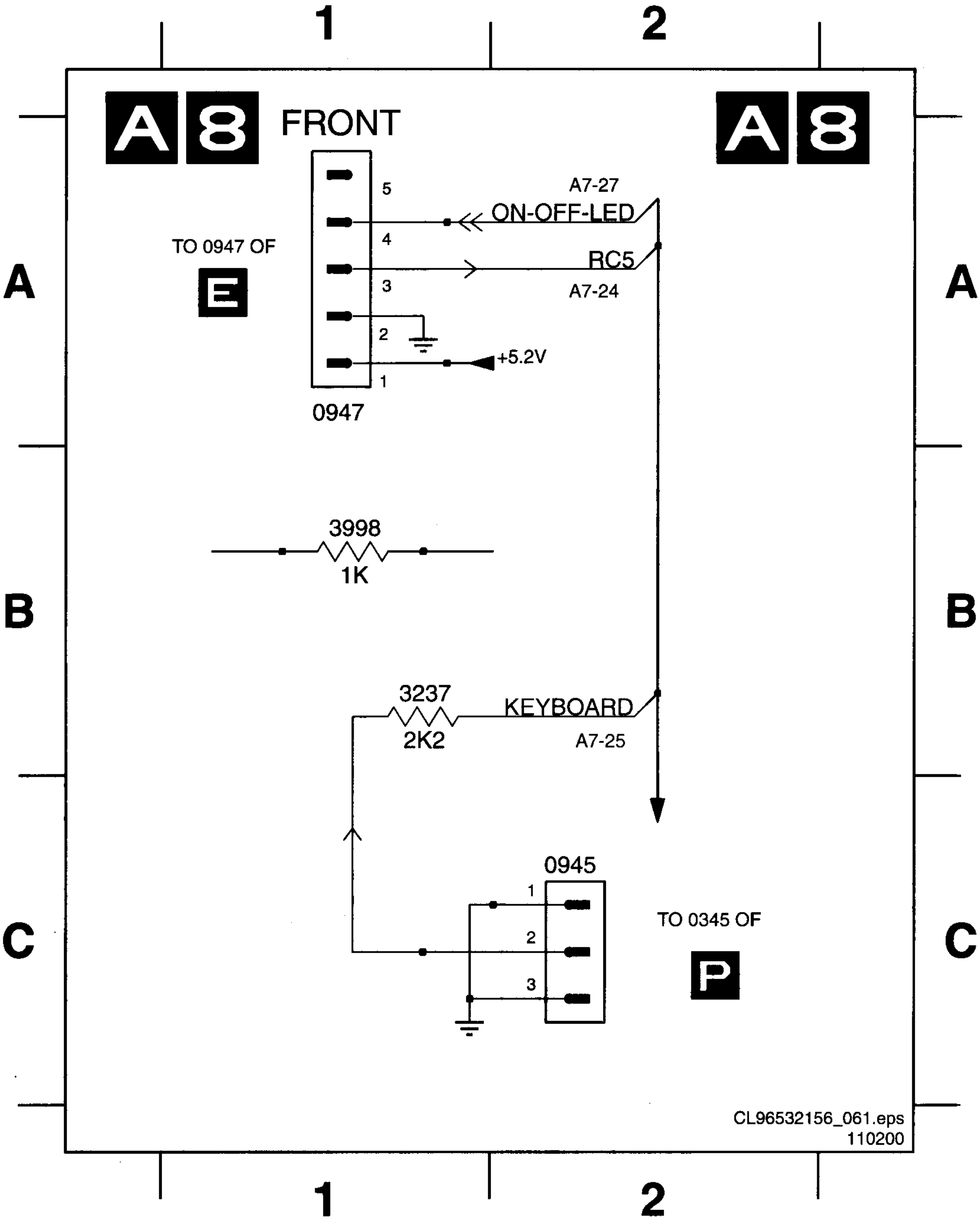

A6
HEADPHONE AMPLIFIER
A1 : A7
A7-34
HEADPHONE-L
A7-35
HEADPHONE-R
2730
22u
3730
10K
3733
8K2
2736
1n5
3734
47K
A12
0.6V
7724
BC847B
2734
22u
3738
56K
3741
68K
2738
470u
3736
1K
3744
220R
+11D
11.3V
5.5V
7720
BC847B
4.9V
4.2V
BC857B
7722
0V
2732
100u
A14
3742
68R
HEADPH-L
2731
22u
3731
10K
3732
8K2
2737
1n5
3735
47K
A13
0.6V
7725
BC847B
2735
22u
3739
56K
3740
68K
2739
470u
3737
1K
3745
220R
+11D
11.3V
5.5V
7721
BC847B
4.9V
4.2V
BC857B
7723
0V
2733
100u
A15
3743
68R
HEADPH-R
CL965321
1
2
3
4
5
6
7

Front



A
B
A7-37
C
D
A7-38
56_059.eps
010300

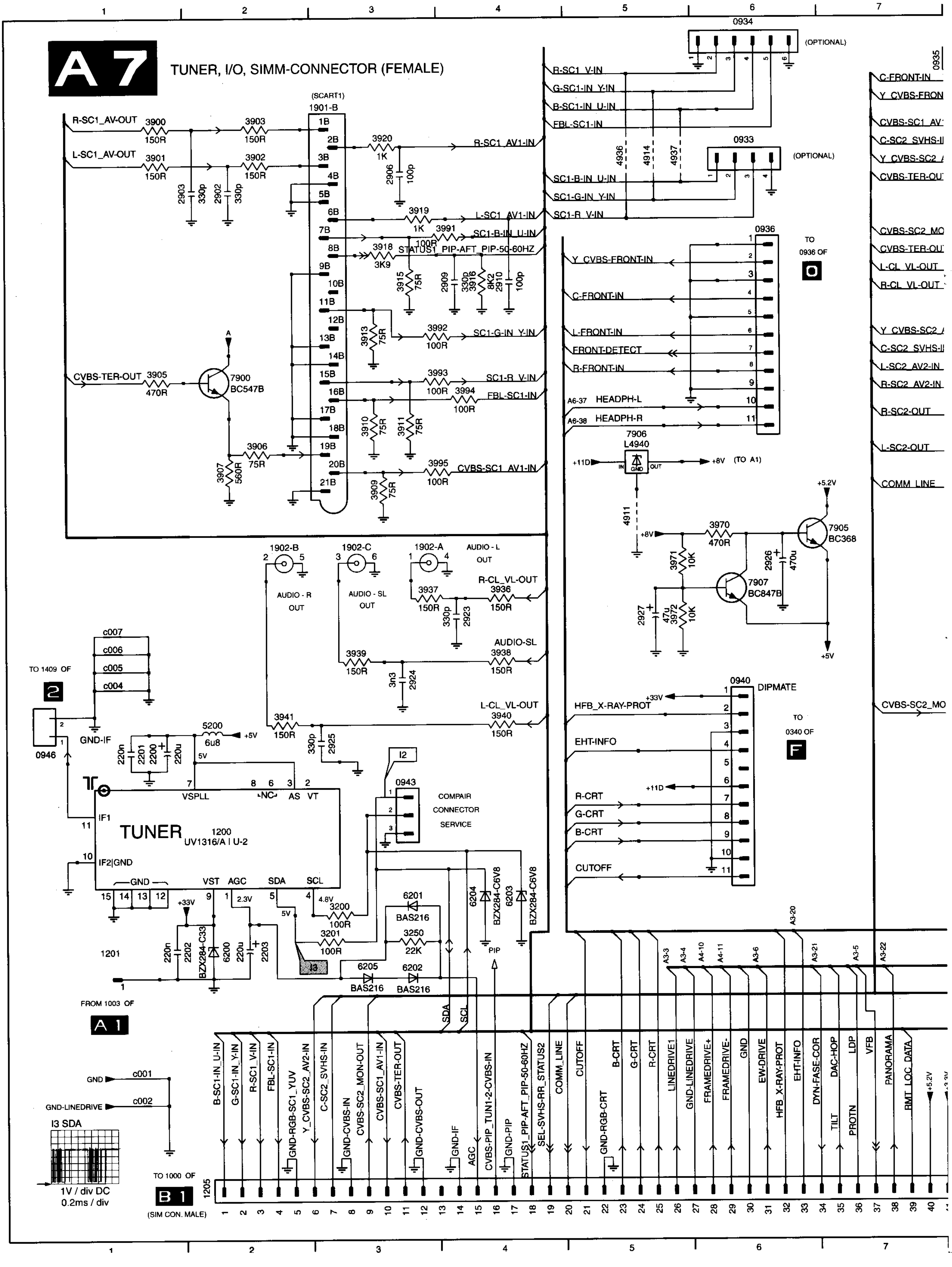
2730	A3
2731	C3
2732	B6
2733	D6
2734	B5
2735	C5
2736	B4
2737	D4
2738	A4
2739	C4
3730	B3
3731	C3
3732	D3
3733	B3
3734	B4
3735	D4
3736	A4
3737	C4
3738	B5
3739	C5
3740	D5
3741	B5
3742	B6
3743	D6
3744	A5
3745	C5
7720	A5
7721	C5
7722	B5
7723	D5
7724	B4
7725	C4

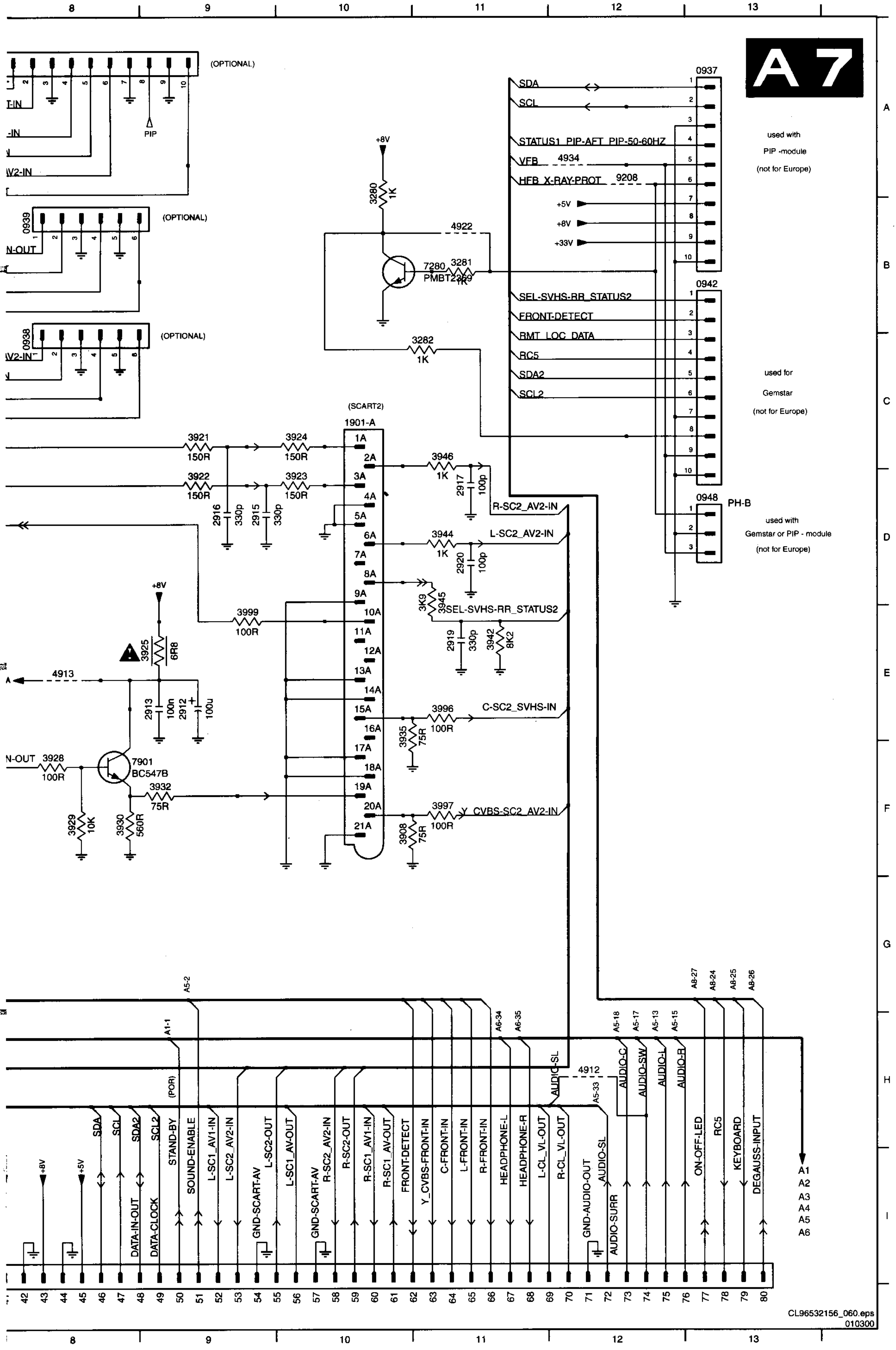


1
2
A8
FRONT
A8
A
B
C
A
B
C
5
4
3
2
1
0947
TO 0947 OF
E
A7-27
ON-OFF-LED
RC5
A7-24
+5.2V
3998
1K
3237
2K2
KEYBOARD
A7-25
0945
1
2
3
TO 0345 OF
P
CL96532156_061.eps
110200
1
2

0947	A1
3237	B1
3998	B1

Tuner, I/O, Simm connector (female)


A7
TUNER, I/O, SIMM-CONNECTOR (FEMALE)
(SCART1)
1901-B
R-SC1_AV-OUT
L-SC1_AV-OUT
3900 150R
3901 150R
3903 150R
3902 150R
2903 330p
2902 330p
3920 1K
2906 100p
R-SC1_AV1-IN
3919 1K
L-SC1_AV1-IN
3991 100R
SC1-B-IN_U-IN
3918 3K9
STATUS1_PIP-AFT_PIP-50-60HZ
3915 75R
2909 330p
3916 8K2
2910 100p
3913 75R
3992 100R
SC1-G-IN_Y-IN
3993 100R
SC1-R_V-IN
3994 100R
FBL-SC1-IN
3910 75R
3911 75R
3995 100R
CVBS-SC1_AV1-IN
3909 75R
CVBS-TER-OUT
3905 470R
7900 BC547B
3906 75R
3907 560R
R-SC1_V-IN
G-SC1-IN_Y-IN
B-SC1-IN_U-IN
FBL-SC1-IN
0934 (OPTIONAL)
0933 (OPTIONAL)
4936
4914
4937
SC1-B-IN_U-IN
SC1-G-IN_Y-IN
SC1-R_V-IN
0936
TO 0936 OF
O
Y_CVBS-FRONT-IN
C-FRONT-IN
L-FRONT-IN
FRONT-DETECT
R-FRONT-IN
A6-37 HEADPH-L
A6-38 HEADPH-R
7906 L4940
+11D
IN GND OUT
+8V (TO A1)
4911
+8V
3970 470R
7905 BC368
+5.2V
3971 10K
2926 470u
7907 BC847B
2927 47u
3972 10K
+5V
0935
C-FRONT-IN
Y_CVBS-FRON
CVBS-SC1_AV
C-SC2_SVHS-I
Y_CVBS-SC2_
CVBS-TER-OU
CVBS-SC2_MO
CVBS-TER-OU
L-CL_VL-OUT
R-CL_VL-OUT
Y_CVBS-SC2_
C-SC2_SVHS-I
L-SC2_AV2-IN
R-SC2_AV2-IN
R-SC2-OUT
L-SC2-OUT
COMM_LINE
CVBS-SC2_MO
1902-B
1902-C
1902-A
AUDIO - L OUT
AUDIO - R OUT
AUDIO - SL OUT
R-CL_VL-OUT
3937 150R
3936 150R
2923 330p
AUDIO-SL
3939 150R
3938 150R
2924 3n3
L-CL_VL-OUT
3941 150R
3940 150R
2925 330p
0940 DIPMATE
TO 0340 OF
F
+33V
HFB_X-RAY-PROT
EHT-INFO
+11D
R-CRT
G-CRT
B-CRT
CUTOFF
c007
c006
c005
c004
TO 1409 OF
2
GND-IF
0946
5200 6u8
+5V
5V
2201 220n
2200 220u
TUNER 1200 UV1316/A I U-2
VSPLL
NC
AS
VT
IF1
IF2|GND
GND
VST
AGC
SDA
SCL
I2
0943
COMPAIR CONNECTOR SERVICE
+33V
2.3V
4.8V
5V
3200 100R
3201 100R
I3
2202 220n
6200 BZX284-C33
2203 220u
1201
6201 BAS216
3250 22K
6205 BAS216
6202 BAS216
6204 BZX284-C6V8
6203 BZX284-C6V8
PIP
FROM 1003 OF
A1
SDA
SCL
GND
c001
GND-LINEDRIVE
c002
I3 SDA
1V / div DC
0.2ms / div
TO 1000 OF
B1
(SIM CON. MALE)
1205
A3-20
A3-3
A3-4
A4-10
A4-11
A3-6
A3-21
A3-5
A3-22
B-SC1-IN_U-IN
G-SC1-IN_Y-IN
R-SC1_V-IN
FBL-SC1-IN
GND-RGB-SC1_YUV
Y_CVBS-SC2_AV2-IN
C-SC2_SVHS-IN
GND-CVBS-IN
CVBS-SC2_MON-OUT
CVBS-SC1_AV1-IN
CVBS-TER-OUT
GND-CVBS-OUT
GND-IF
AGC
CVBS-PIP_TUN1-2-CVBS-IN
GND-PIP
STATUS1_PIP-AFT_PIP-50-60HZ
SEL-SVHS-RR_STATUS2
COMM_LINE
CUTOFF
GND-RGB-CRT
B-CRT
G-CRT
R-CRT
LINEDRIVE1
GND-LINEDRIVE
FRAMEDRIVE+
FRAMEDRIVE-
GND
EW-DRIVE
HFB_X-RAY-PROT
EHT-INFO
DYN-FASE-COR
DAC-HOP
TILT
LDP
PROTN
VFB
PANORAMA
RMT_LOC_DATA
+5.2V
1 2 3 4 5 6 7


A 7
8
9
10
11
12
13
A
B
C
D
E
F
G
H
I
(OPTIONAL)
PIP
T-IN
-IN
V2-IN
0939
N-OUT
0938
V2-IN
0937
SDA
SCL
STATUS1_PIP-AFT_PIP-50-60HZ
VFB
4934
HFB_X-RAY-PROT
9208
+5V
+8V
+33V
used with
PIP -module
(not for Europe)
+8V
3280
1K
4922
7280
PMBT2369
3281
1K
3282
1K
0942
SEL-SVHS-RR_STATUS2
FRONT-DETECT
RMT_LOC_DATA
RC5
SDA2
SCL2
used for
Gemstar
(not for Europe)
0948
PH-B
used with
Gemstar or PIP - module
(not for Europe)
(SCART2)
1901-A
1A
2A
3A
4A
5A
6A
7A
8A
9A
10A
11A
12A
13A
14A
15A
16A
17A
18A
19A
20A
21A
3921
150R
3924
150R
3922
150R
3923
150R
2916
330p
2915
330p
3946
1K
2917
100p
R-SC2_AV2-IN
3944
1K
2920
100p
L-SC2_AV2-IN
3K9
3945
SEL-SVHS-RR_STATUS2
2919
330p
3942
8K2
3999
100R
+8V
3925
6R8
4913
2913
100n
2912
100u
3996
100R
C-SC2_SVHS-IN
3935
75R
N-OUT
3928
100R
7901
BC547B
3932
75R
3997
100R
Y_CVBS-SC2_AV2-IN
3908
75R
3929
10K
3930
560R
A5-2
A1-1
A6-34
A6-35
A8-27
A8-24
A8-25
A8-26
A5-18
A5-17
A5-13
A5-15
AUDIO-SL
4912
A5-33
AUDIO-C
AUDIO-SW
AUDIO-L
AUDIO-R
(POR)
+8V
+5V
SDA
SCL
SDA2
SCL2
DATA-IN-OUT
DATA-CLOCK
STAND-BY
SOUND-ENABLE
L-SC1_AV1-IN
L-SC2_AV2-IN
GND-SCART-AV
L-SC2-OUT
L-SC1_AV-OUT
GND-SCART-AV
R-SC2_AV2-IN
R-SC2-OUT
R-SC1_AV1-IN
R-SC1_AV-OUT
FRONT-DETECT
Y_CVBS-FRONT-IN
C-FRONT-IN
L-FRONT-IN
R-FRONT-IN
HEADPHONE-L
HEADPHONE-R
L-CL_VL-OUT
R-CL_VL-OUT
GND-AUDIO-OUT
AUDIO-SL
AUDIO-SURR
ON-OFF-LED
RC5
KEYBOARD
DEGAUSS-INPUT
A1
A2
A3
A4
A5
A6
42
43
44
45
46
47
48
49
50
51
52
53
54
55
56
57
58
59
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72
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79
80
CL96532156_060.eps
010300

0933 A6	7906 C5
0934 A6	7907 E6
0935 A7	9208 A12
0936 B6	c001 I1
0937 A13	c002 I1
0938 C8	c004 E1
0939 B8	c005 E1
0940 E6	c006 E1
0942 B13	c007 E1
0943 F3	
0946 F1	
0948 D13	
1200 G2	
1201 H1	
1205 I2	
1901-A C10	
1901-B A2	
1902-A D3	
1902-B D2	
1902-C D3	
2200 F1	
2201 F1	
2202 H1	
2203 H2	
2902 B2	
2903 B2	
2906 A3	
2909 B4	
2910 B4	
2912 E9	
2913 E9	
2915 D9	
2916 D9	
2917 D11	
2919 E11	
2920 D11	
2923 E4	
2924 E3	
2925 F3	
2926 D6	
2927 E5	
3200 G3	
3201 G3	
3250 G3	
3280 A10	
3281 B11	
3282 C11	
3900 A1	
3901 A1	
3902 A2	
3903 A2	
3905 C1	
3906 D2	
3907 D2	
3908 F10	
3909 D3	
3910 C3	
3911 C3	
3913 C3	
3915 B3	
3916 B4	
3918 B3	
3919 B3	
3920 A3	
3921 C9	
3922 D9	
3923 D10	
3924 C10	
3925 E9	
3928 F8	
3929 F8	
3930 F8	
3932 F9	
3935 E10	
3936 E4	
3937 E3	
3938 E4	
3939 E3	
3940 F4	
3941 F2	
3942 E11	
3944 D11	
3945 D11	
3946 C11	
3970 D6	
3971 D5	
3972 E5	
3991 B4	
3992 C4	
3993 C4	
3994 C4	
3995 D4	
3996 E11	
3997 F11	
3999 E9	
4911 D5	
4912 H12	
4913 E8	
4914 A5	
4922 B11	
4934 A12	
4936 A5	
4937 A5	
5200 F2	
6200 H2	
6201 G3	
6202 H3	
6203 G4	
6204 G4	
6205 H3	
7280 B11	
7900 C2	
7901 F8	
7905 D7	

LSP (copper side overview)

Part 1

CL96532156_083.pdf
180200

Part 3

CL96532156_085.pdf
180200

0010	A9
0020	C8
0030	A7
0035	A7
0040	D5
0041	G5
0045	F7
0317	B4
0324	A6
0325	A1
0390	D1
0391	A2
0392	A4
0393	C1
0395	B1
0735	F6
0736	F6
0737	F7
0738	F6
0739	F5
0933	F1
0934	E1
0935	F1
0936	E4
0937	G2
0938	F1
0939	F2
0940	E2
0942	G3
0943	G1
0945	E10
0946	G2
0947	A10
0948	G2
1001	A8
1002	D8
1003	A6
1200	G1
1201	F1
1205	E3
1501	B9
1503	B7
1901	E1
1902	F1
2101	D9
2102	D9
2103	D9
2104	E8
2105	C9
2106	C9
2107	E9
2108	C9
2109	E9
2110	C9
2111	C9
2113	E8
2114	B9
2200	F1
2201	G1
2202	G1
2203	G1
2400	B5
2401	B4
2409	D3
2412	D3
2413	D3
2414	D3
2415	D4
2416	D3
2417	D4
2418	C3
2419	C5
2420	C3
2421	B6
2422	B6
2423	B5
2425	C4
2426	C4
2429	C5
2430	C6
2431	B4
2432	B5
2433	B4
2434	B5
2435	C4
2443	C1
2444	D1
2445	D1
2446	C1
2447	C1
2450	A2
2455	D2
2459	A5
2460	A4
2461	A4
2462	C1
2463	C1
2464	C2
2465	C2
2466	A6
2467	A5
2468	A5
2469	A4
2480	C6
2488	C4
2489	C1
2490	A6
2491	D2
2492	D4
2495	D3
2498	B5
2499	C5
2501	C7
2502	C7
2503	D7
2505	A6
2507	B8
2508	A7
2509	A7
2510	B6
2512	E6
2513	D7
2514	D7
2515	C6
2516	B7
2517	A6
2518	C7
2519	E7
2520	C7
2521	A6
2523	C6
2528	E8
2530	D7
2531	D6
2535	E6
2536	E7
2537	A8
2538	B7
2600	C1
2601	C1
2602	B1
2603	A1
2604	A1
2605	C1
2610	B1
2620	A1
2621	A1
2622	A1
2624	A1
2625	A1
2627	A1
2629	A1
2640	B1
2642	C2
2653	A1
2704	G4
2710	F5
2711	F4
2712	F4
2730	D4
2731	E4
2732	E6
2733	E6
2734	D5
2735	E5
2736	E5
2737	E5
2738	D5
2739	E5
2756	F6
2758	F5
2759	G6
2760	F6
2761	F3
2762	G6
2763	G6
2765	G4
2766	F7
2767	G4
2768	G6
2774	F6
2775	F7
2776	F7
2782	F4
2783	F6
2784	G5
2785	G5
2786	G5
2787	F5
2902	D1
2903	D1
2906	D1
2909	E1
2910	E1
2912	F1
2913	F1
2915	D1
2916	D1
2917	D1
2919	E1
2920	E1
2923	F1
2924	F1
2925	F1
2926	E3
2927	F3
2941	G4
2942	G4
2943	F5
2944	G5
2946	G6
2951	G5
2952	F6
2953	F4
3101	C9
3102	D9
3103	D9
3104	C9
3105	D9
3106	E9
3107	D9
3108	C9
3110	C8
3113	E9
3114	E9
3117	D9
3118	C9
3120	E9
3123	E9
3124	E9
3125	C10
3126	C10
3127	C9
3200	G1
3201	G1
3237	E9
3250	G1
3280	G3
3281	G3
3282	G3
3401	B4
3402	D3
3403	D3
3404	D3
3406	D4
3407	D4
3409	C2
3410	D4
3411	D3
3414	D4
3415	D4
3416	D4
3417	C4
3418	C6
3423	C4
3425	C5
3426	C5
3431	B4
3439	C1
3440	C1
3441	C1
3442	C1
3443	C1
3444	D1
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3460	A4
3461	A4
3462	C2
3463	C1
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3465	C2
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3468	A4
3469	A5
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3536	E6
3537	E6
3538	E6
3539	E6
3540	D6
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3544	B7
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3623	A1
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3626	A1
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3702	G3
3703	G6
3704	G5
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3717	G4
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6462	C1
6463	C1

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6517	D6
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6522	E6
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6731	G4
7100	C9
7101	C9
7102	D8
7103	E9
7104	E9
7280	G3
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7409	D4
7421	D3
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7441	C1
7442	C1
7480	D5
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7483	D2
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7506	D8
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7511	E6
7528	E7
7529	D7
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7724	D5
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7740	G5
7750	G4
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9110	E7
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9231	E2
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9431	A1
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9480	C5
9501	B7
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9503	B7
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9511	C7
9512	C7
9513	C7
9514	C8
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9517	E7
9518	C7
9519	C8
9520	E6
9523	D7
9524	D7
9525	C7
9526	A7
9620	A1
9622	A1
9623	B2
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9705	G7
9707	G4
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9721	G6
9722	G4
9723	F5
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9919	E3
9922	E2
9925	F2
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9928	F3
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9992	F4
9993	F2
9994	F2
9995	F2
9996	F3
9997	G2
9998	G3
9999	F4

CL96532156_090.eps
030300

Part 2

CL96532156_084.pdf
180200

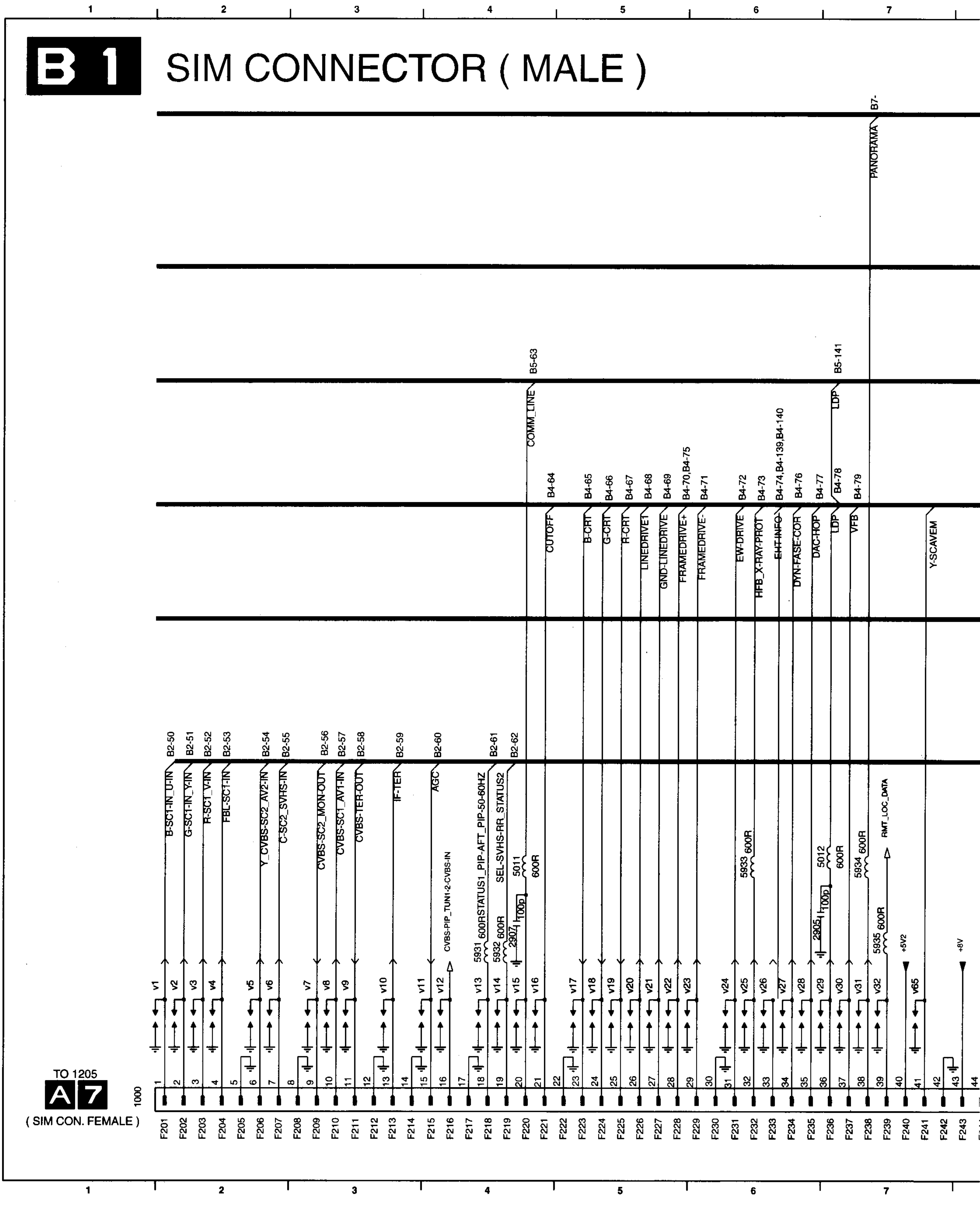
Part 4

CL96532156_086.pdf
180200

CL96532156_073.eps
030300

Sim connector (male)

v5 G2	v9 G3	v13 G4	v17 G5	v21 G5	v25 G6	v29 G7	v33 G8	v37 G9	v41 G9	v45 G10	v49 G11	v53 G11	v57 G12	v61 G12	v65 G7
v6 G2	v10 G3	v14 G4	v18 G5	v22 G5	v26 G6	v30 G7	v34 G8	v38 G9	v42 G9	v46 G10	v50 G11	v54 G11	v58 G12	v62 G13	0010 G14
v7 G3	v11 G4	v15 G4	v19 G5	v23 G6	v27 G6	v31 G7	v35 G8	v39 G9	v43 G10	v47 G10	v51 G11	v55 G11	v59 G12	v63 G13	1000 H1
v8 G3	v12 G4	v16 G4	v20 G5	v24 G6	v28 G6	v32 G7	v36 G8	v40 G9	v44 G10	v48 G10	v52 G11	v56 G12	v60 G12	v64 G13	2900 G12


1
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7
B 1
SIM CONNECTOR (MALE)
B7-
PANORAMA
B5-63
COMM_LINE
B5-141
LDP
B4-64
B4-65
B4-66
B4-67
B4-68
B4-69
B4-70,B4-75
B4-71
B4-72
B4-73
B4-74,B4-139,B4-140
B4-76
B4-77
B4-78
B4-79
CUTOFF
B-CRT
G-CRT
R-CRT
LINEDRIVE1
GND-LINEDRIVE
FRAMEDRIVE+
FRAMEDRIVE-
EW-DRIVE
HFB_X-RAY-PROT
EHT-INFO
DYN-FASE-COR
DAC-HOP
LDP
VFB
Y-SCAVEM
B2-50
B2-51
B2-52
B2-53
B2-54
B2-55
B2-56
B2-57
B2-58
B2-59
B2-60
B2-61
B2-62
B-SC1-IN_U-IN
G-SC1-IN_Y-IN
R-SC1_V-IN
FBL-SC1-IN
Y_CVBS-SC2_AV2-IN
C-SC2_SVHS-IN
CVBS-SC2_MON-OUT
CVBS-SC1_AV1-IN
CVBS-TER-OUT
IF-TER
AGC
CVBS-PIP_TUN1-2-CVBS-IN
5931 600R
STATUS1_PIP-AFT_PIP-50-60HZ
5932 600R
SEL-SVHS-RR_STATUS2
2907
100p
5011
600R
5933 600R
5012
600R
2905
100p
5934 600R
5935 600R
RMT_LOC_DATA
+5V2
+8V
v1
v2
v3
v4
v5
v6
v7
v8
v9
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v32
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1000
TO 1205
A 7
(SIM CON. FEMALE)
F201
F202
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2902	G13
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2911	G9
2912	G10
2913	G10
2914	G10
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2917	G10
5010	F13
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5013	F8
5014	G8
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5018	F9
5019	F12
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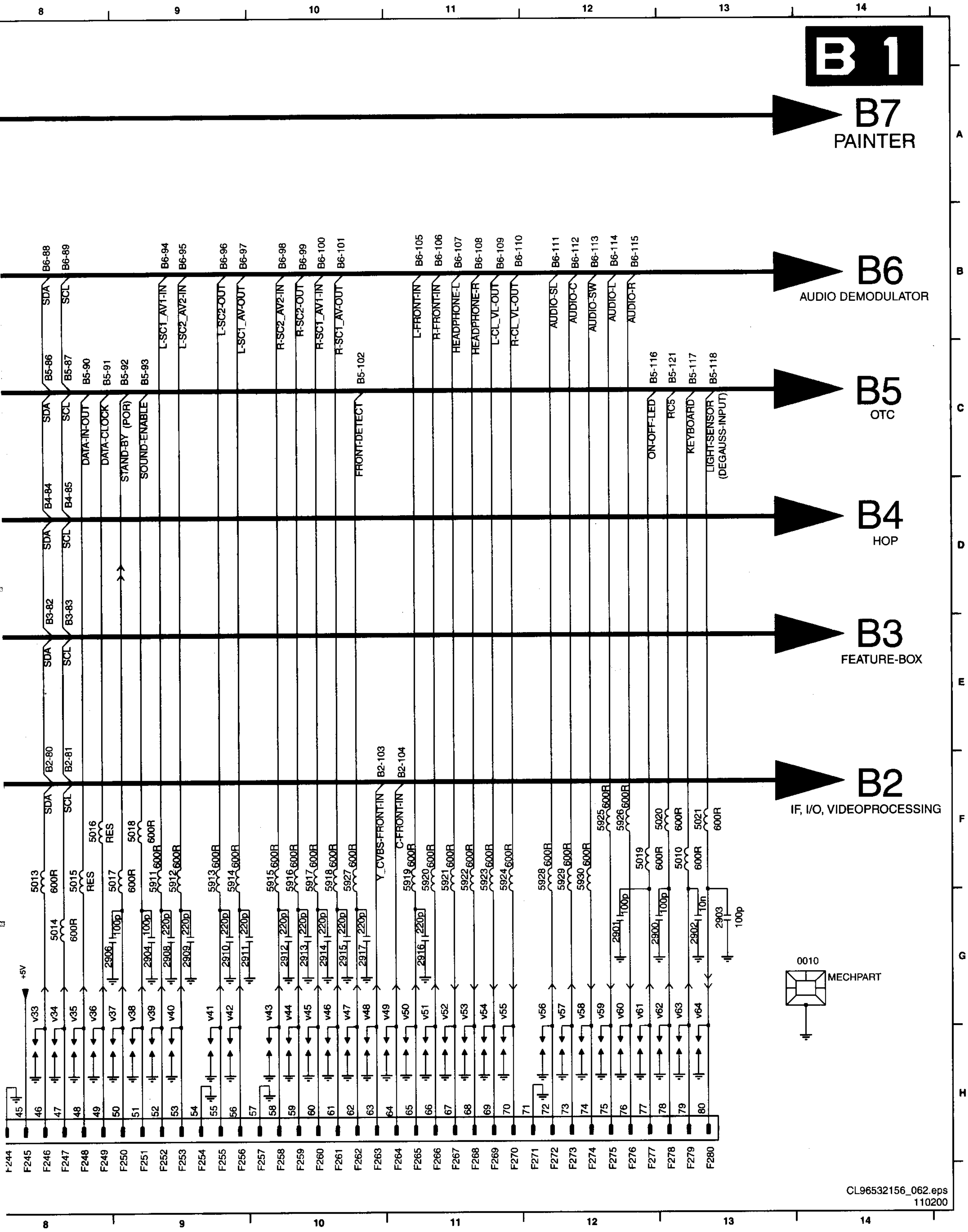
8
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13
14
A
B
C
D
E
F
G
H
B 1
B7
PAINTER
B6
AUDIO DEMODULATOR
B5
OTC
B4
HOP
B3
FEATURE-BOX
B2
IF, I/O, VIDEOPROCESSING
B6-88
B6-89
B6-94
B6-95
B6-96
B6-97
B6-98
B6-99
B6-100
B6-101
B6-105
B6-106
B6-107
B6-108
B6-109
B6-110
B6-111
B6-112
B6-113
B6-114
B6-115
SDA
SCL
L-SC1_AV1-IN
L-SC2_AV2-IN
L-SC2-OUT
L-SC1_AV-OUT
R-SC2_AV2-IN
R-SC2-OUT
R-SC1_AV1-IN
R-SC1_AV-OUT
L-FRONT-IN
R-FRONT-IN
HEADPHONE-L
HEADPHONE-R
L-CL_VL-OUT
R-CL_VL-OUT
AUDIO-SL
AUDIO-C
AUDIO-SW
AUDIO-L
AUDIO-R
B5-86
B5-87
B5-90
B5-91
B5-92
B5-93
B5-102
B5-116
B5-121
B5-117
B5-118
DATA-IN-OUT
DATA-CLOCK
STAND-BY (POR)
SOUND-ENABLE
FRONT-DETECT
ON-OFF-LED
RC5
KEYBOARD
LIGHT-SENSOR
(DEGAUSS-INPUT)
B4-84
B4-85
B3-82
B3-83
B2-80
B2-81
B2-103
B2-104
Y_CVBS-FRONT-IN
C-FRONT-IN
5013 600R
5014 600R
5015 RES
5016 RES
5017 600R
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5019 600R
5020 600R
5010 600R
5021 600R
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2914 220p
2915 220p
2917 220p
2916 220p
2901 100p
2900 100p
2902 10n
2903 100p
+5V
v33
v34
v35
v36
v37
v38
v39
v40
v41
v42
v43
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v45
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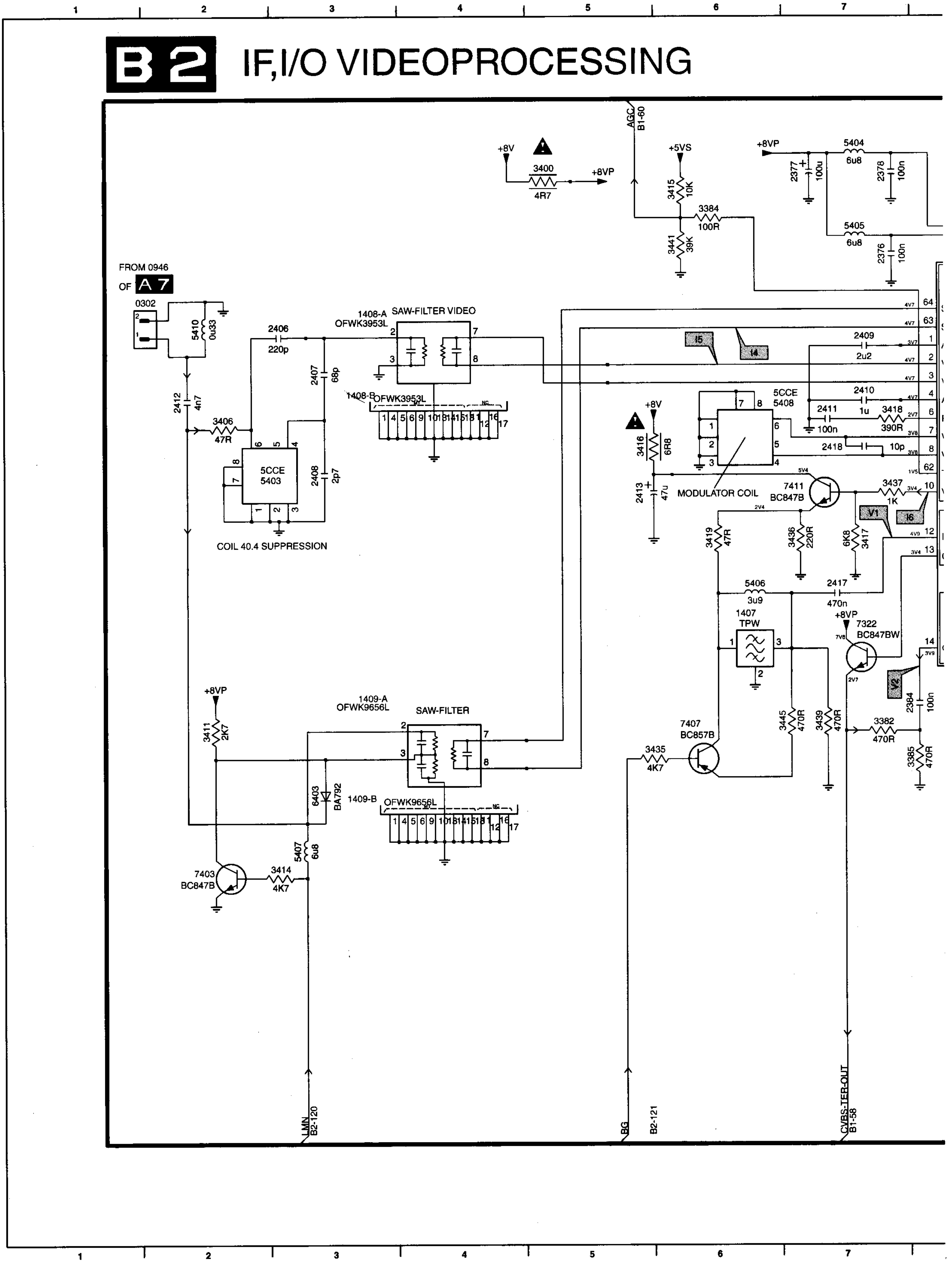
0010
MECHPART

CL96532156_062.eps
110200

IF, I/O videoprocessing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IF,I/O VIDEOPROCESSING
FROM 0946
OF A7
0302
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2407 68p
2412 4n7
3406 47R
5CCE 5403
2408 2p7
COIL 40.4 SUPPRESSION
1408-A OFWK3953L
SAW-FILTER VIDEO
1408-B OFWK3953L
+8V
3400 4R7
+8VP
AGC B1-60
+5VS
3415 10K
3384 100R
3441 39K
+8VP
2377 100u
5404 6u8
2378 100n
5405 6u8
2376 100n
I5
I4
2409 2u2
2410 1u
2411 100n
3418 390R
2418 10p
5CCE 5408
MODULATOR COIL
+8V
3416 6R8
2413 47u
7411 BC847B
3437 1K
V1
I6
3419 47R
3436 220R
3417 6K8
5406 3u9
2417 470n
1407 TPW
+8VP
7322 BC847BW
V2
2384 100n
3382 470R
3385 470R
3445 470R
3439 470R
7407 BC857B
3435 4K7
+8VP
3411 2K7
1409-A OFWK9656L
SAW-FILTER
1409-B OFWK9656L
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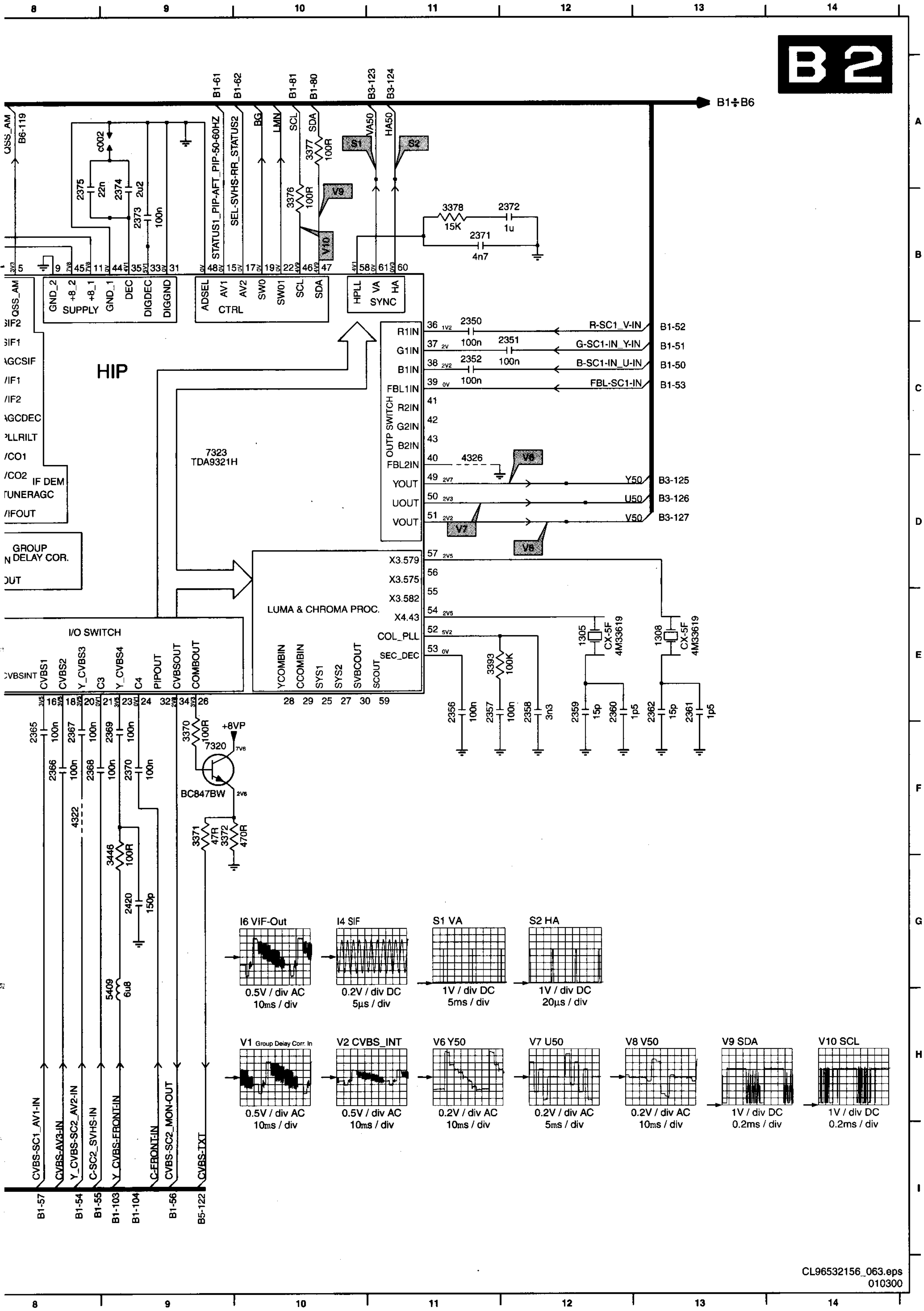
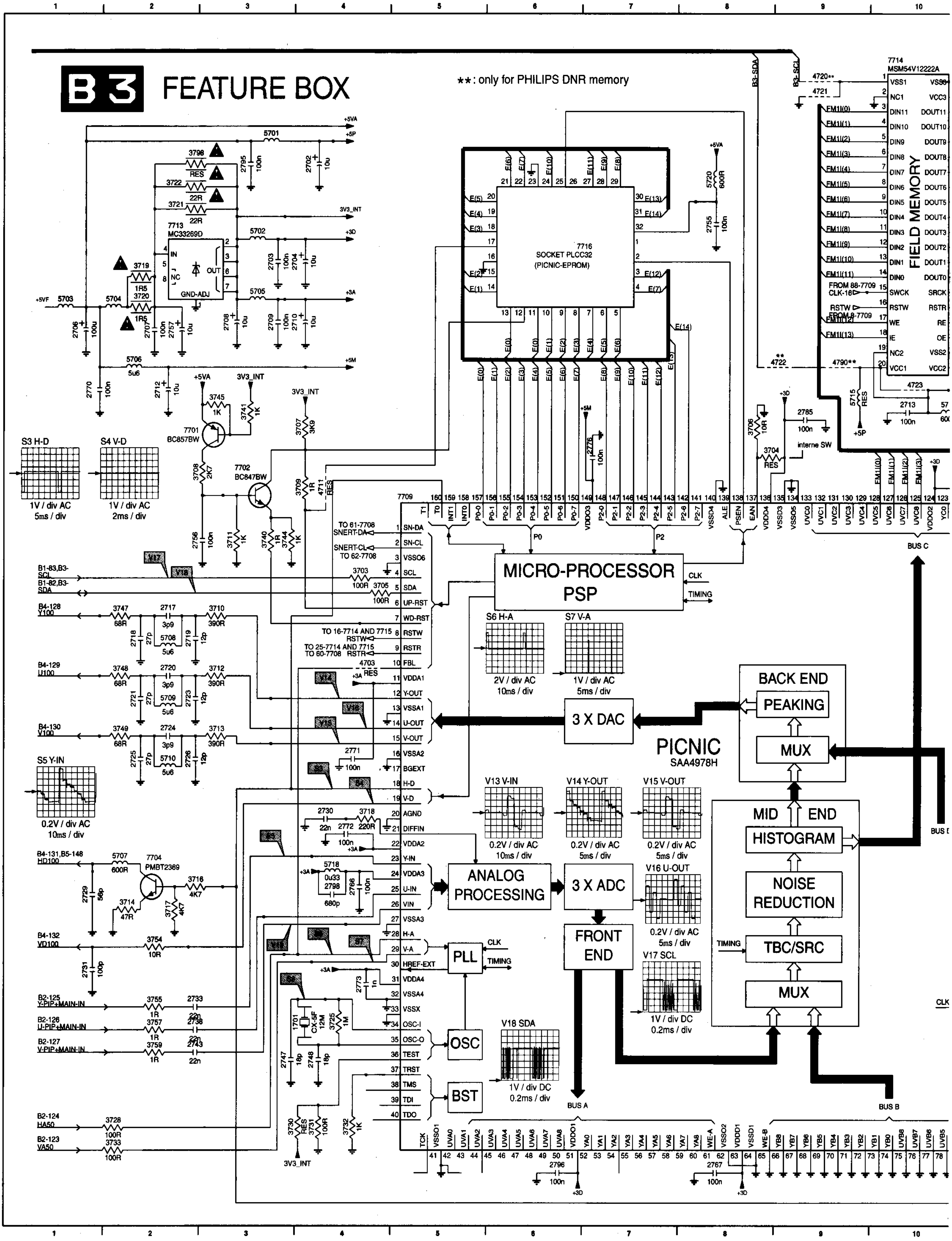
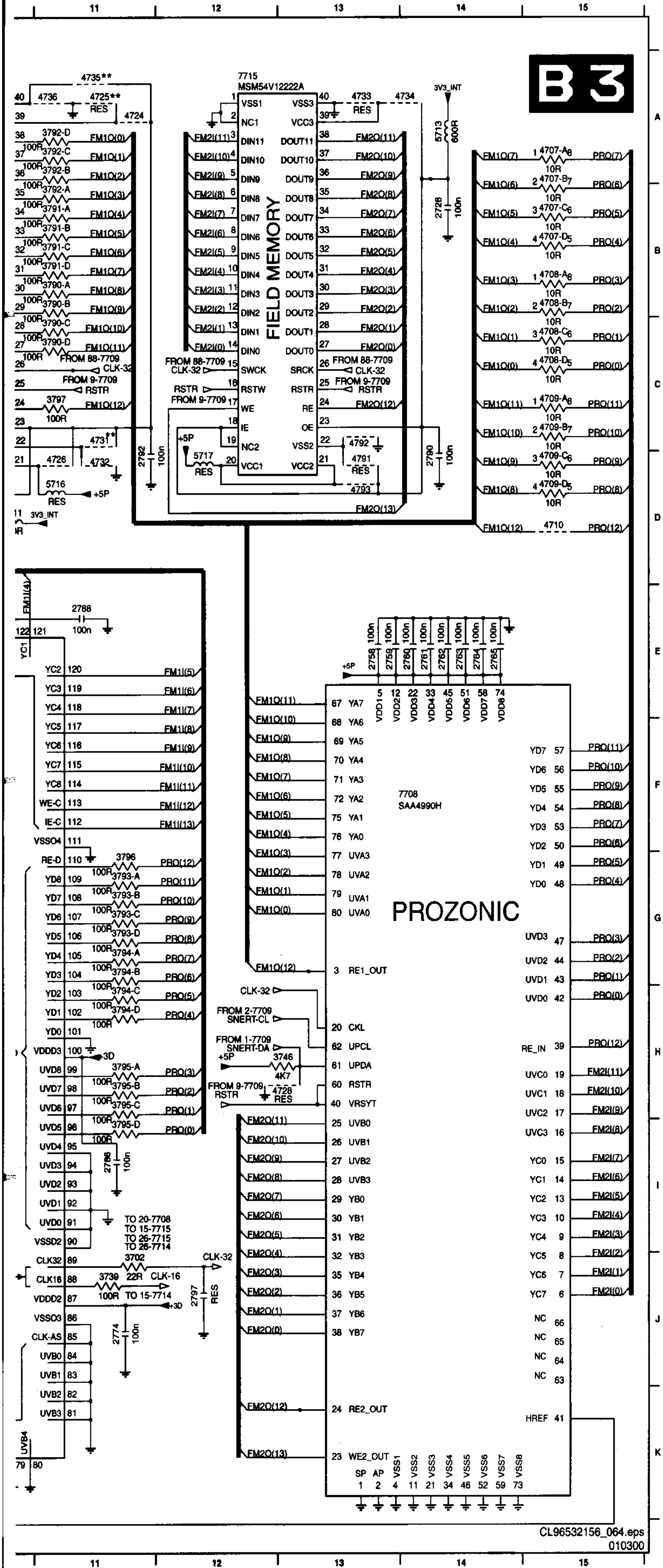
LMN B2-120
BG B2-121
CVBS-TER-OUT B1-58
1 2 3 4 5 6 7


B2
B1÷B6
HIP
7323
TDA9321H
SUPPLY
CTRL
SYNC
OUTP SWITCH
LUMA & CHROMA PROC.
I/O SWITCH
GROUP DELAY COR.
IF DEM
R-SC1_V-IN
G-SC1-IN_Y-IN
B-SC1-IN_U-IN
FBL-SC1-IN
Y50
U50
V50
B1-52
B1-51
B1-50
B1-53
B3-125
B3-126
B3-127
B1-61
B1-62
B1-81
B1-80
B3-123
B3-124
STATUS1_PIP-AFT_PIP-50-60HZ
SEL-SVHS-RR_STATUS2
BG
LMN
SCL
SDA
VA50
HA50
S1
S2
V6
V7
V8
V9
V10
7320
BC847BW
+8VP
1305
CX-5F 4M33619
1308
CX-5F 4M33619
CVBS-SC1_AV1-IN
CVBS-AV3-IN
Y_CVBS-SC2_AV2-IN
C-SC2_SVHS-IN
Y_CVBS-FRONT-IN
C-FRONT-IN
CVBS-SC2_MON-OUT
CVBS-TXT
B1-57
B1-54
B1-55
B1-103
B1-104
B1-56
B5-122
I6 VIF-Out
0.5V / div AC
10ms / div
I4 SIF
0.2V / div DC
5µs / div
S1 VA
1V / div DC
5ms / div
S2 HA
1V / div DC
20µs / div
V1 Group Delay Corr. In
0.5V / div AC
10ms / div
V2 CVBS_INT
0.5V / div AC
10ms / div
V6 Y50
0.2V / div AC
10ms / div
V7 U50
0.2V / div AC
5ms / div
V8 V50
0.2V / div AC
10ms / div
V9 SDA
1V / div DC
0.2ms / div
V10 SCL
1V / div DC
0.2ms / div
CL96532156_063.eps
010300

0302	B1
1305	E12
1308	E13
1407	E6
1408-A	B3
1408-B	C3
1409-A	E3
1409-B	F3
2350	C11
2351	C12
2352	C11
2356	E11
2357	E11
2358	E12
2359	E12
2360	E12
2361	E13
2362	E13
2365	F8
2366	F8
2367	F8
2368	F8
2369	F9
2370	F9
2371	B11
2372	B12
2373	B9
2374	A9
2375	A8
2376	B7
2377	A7
2378	A7
2384	F8
2406	C3
2407	C3
2408	D3
2409	C7
2410	C7
2411	C7
2412	C2
2413	D5
2417	E7
2418	D7
2420	G9
3370	F9
3371	F9
3372	F9
3376	B10
3377	A10
3378	B11
3382	F7
3384	B6
3385	F8
3393	E11
3400	A5
3406	C2
3411	F2
3414	G3
3415	B6
3416	D5
3417	D7
3418	C7
3419	D6
3435	F6
3436	D7
3437	D7
3439	F7
3441	B6
3445	F7
3446	F9
4322	F8
4326	D11
5403	D2
5404	A7
5405	B7
5406	E6
5407	G3
5408	C6
5409	G9
5410	C2
6403	F3
7320	F9
7322	E7
7323	C9
7403	G2
7407	F6
7411	D7
c002	A9

Feature box


B3 FEATURE BOX
**: only for PHILIPS DNR memory
7714 MSM54V12222A
FIELD MEMORY
7713 MC33269D
7716 SOCKET PLCC32 (PICNIC-EPROM)
7709
MICRO-PROCESSOR PSP
CLK
TIMING
3 X DAC
PICNIC SAA4978H
BACK END
PEAKING
MUX
MID END
HISTOGRAM
NOISE REDUCTION
TBC/SRC
MUX
ANALOG PROCESSING
3 X ADC
FRONT END
PLL
OSC
BST
BUS A
BUS B
BUS C
7701 BC857BW
7702 BC847BW
7704 PMBT2369
1701 CX-5F 12M
S3 H-D 1V / div AC 5ms / div
S4 V-D 1V / div AC 2ms / div
S5 Y-IN 0.2V / div AC 10ms / div
S6 H-A 2V / div AC 10ms / div
S7 V-A 1V / div AC 5ms / div
V13 V-IN 0.2V / div AC 10ms / div
V14 Y-OUT 0.2V / div AC 5ms / div
V15 V-OUT 0.2V / div AC 5ms / div
V16 U-OUT 0.2V / div AC 5ms / div
V17 SCL 1V / div DC 0.2ms / div
V18 SDA 1V / div DC 0.2ms / div
B1-83,B3-SCL
B1-82,B3-SDA
B4-128 Y100
B4-129 U100
B4-130 V100
B4-131,B5-148 HD100
B4-132 VD100
B2-125 Y-PIP+MAIN-IN
B2-126 U-PIP+MAIN-IN
B2-127 V-PIP+MAIN-IN
B2-124 HA50
B2-123 VA50
TO 61-7708 SNERT-DA
SNERT-CL TO 62-7708
TO 16-7714 AND 7715 RSTW
TO 25-7714 AND 7715 TO 60-7708 RSTR
1 SN-DA
2 SN-CL
3 VSSO6
4 SCL
5 SDA
6 UP-RST
7 WD-RST
8 RSTW
9 RSTR
10 FBL
11 VDDA1
12 Y-OUT
13 VSSA1
14 U-OUT
15 V-OUT
16 VSSA2
17 BGEXT
18 H-D
19 V-D
20 AGND
21 DIFFIN
22 VDDA2
23 Y-IN
24 VDDA3
25 U-IN
26 VIN
27 VSSA3
28 H-A
29 V-A
30 HREF-EXT
31 VDDA4
32 VSSA4
33 VSSX
34 OSC-I
35 OSC-O
36 TEST
37 TRST
38 TMS
39 TDI
40 TDO
+5VA
+5P
3V3_INT
+3D
+3A
+5M
+5VF
interne SW
FROM 88-7709 CLK-16
FROM 8-7709 RSTW

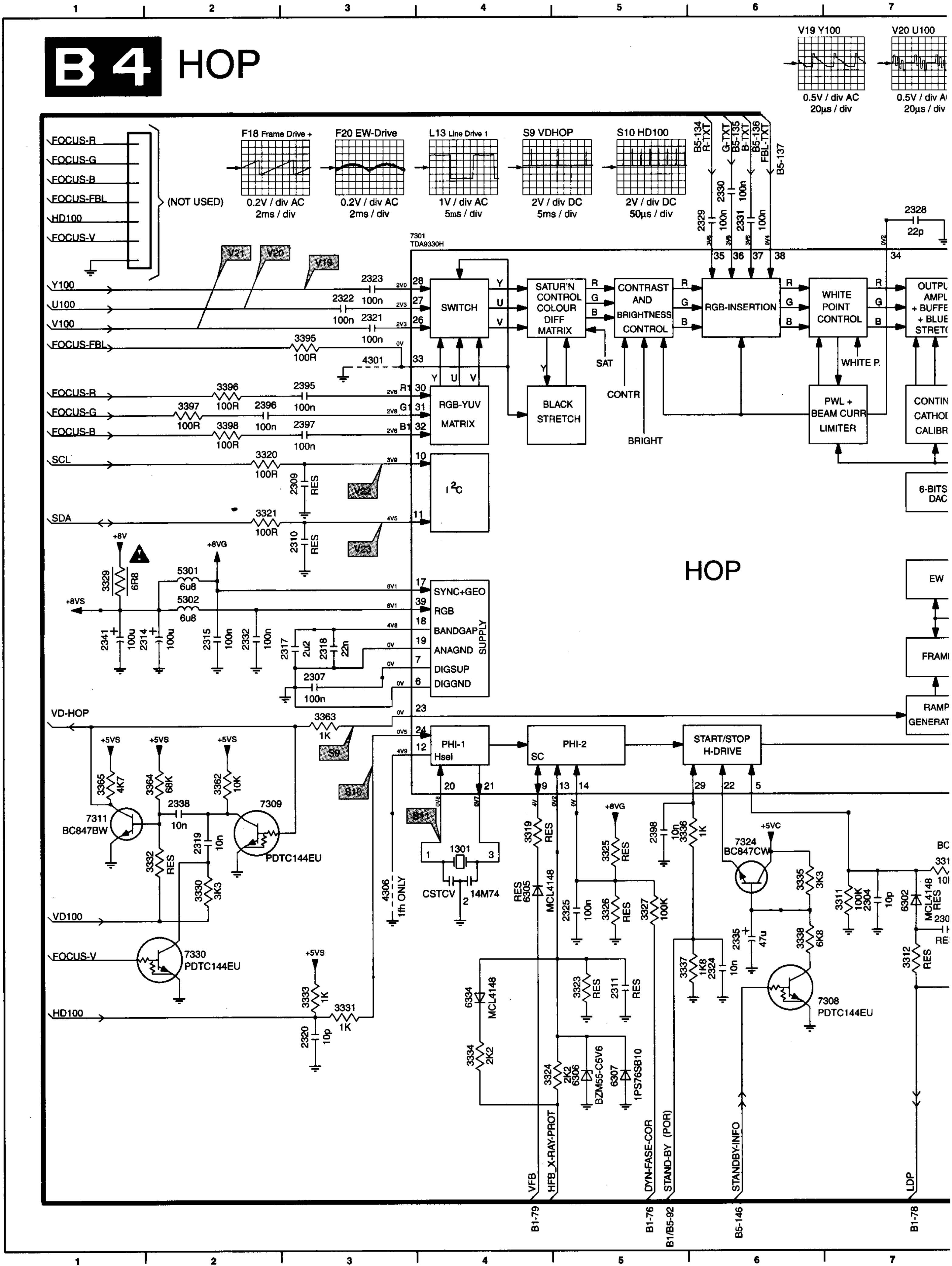

B3
11
12
13
14
15
A
B
C
D
E
F
G
H
I
J
K
7715
MSM54V12222A
FIELD MEMORY
VSS1
NC1
VSS3
VCC3
SWCK
SRCK
RSTW
RSTR
WE
RE
IE
OE
NC2
VSS2
VCC1
VCC2
FROM 88-7709
CLK-32
FROM 9-7709
RSTR
4733
4734
RES
3V3_INT
5713
600R
2728
100n
2792
2790
5716
5717
RES
+5P
4735**
4736
4725**
4724
4726
4731**
4732
4791
4792
4793
4707-A
4707-B
4707-C
4707-D
4708-A
4708-B
4708-C
4708-D
4709-A
4709-B
4709-C
4709-D
4710
10R
100R
3790-A
3790-B
3790-C
3790-D
3791-A
3791-B
3791-C
3791-D
3792-A
3792-B
3792-C
3792-D
3797
7708
SAA4990H
PROZONIC
RE1_OUT
RE2_OUT
WE2_OUT
CKL
UPCL
UPDA
RSTR
VRSYT
HREF
RE_IN
FROM 2-7709
SNERT-CL
FROM 1-7709
SNERT-DA
3746
4K7
4728
RES
2788
2786
2774
2797
3702
3739
22R
CLK-16
CLK-32
TO 20-7708
TO 15-7715
TO 26-7715
TO 26-7714
TO 15-7714
2758
2759
2760
2761
2762
2763
2764
2765
3793-A
3793-B
3793-C
3793-D
3794-A
3794-B
3794-C
3794-D
3795-A
3795-B
3795-C
3795-D
3796
CL96532156_064.eps
010300

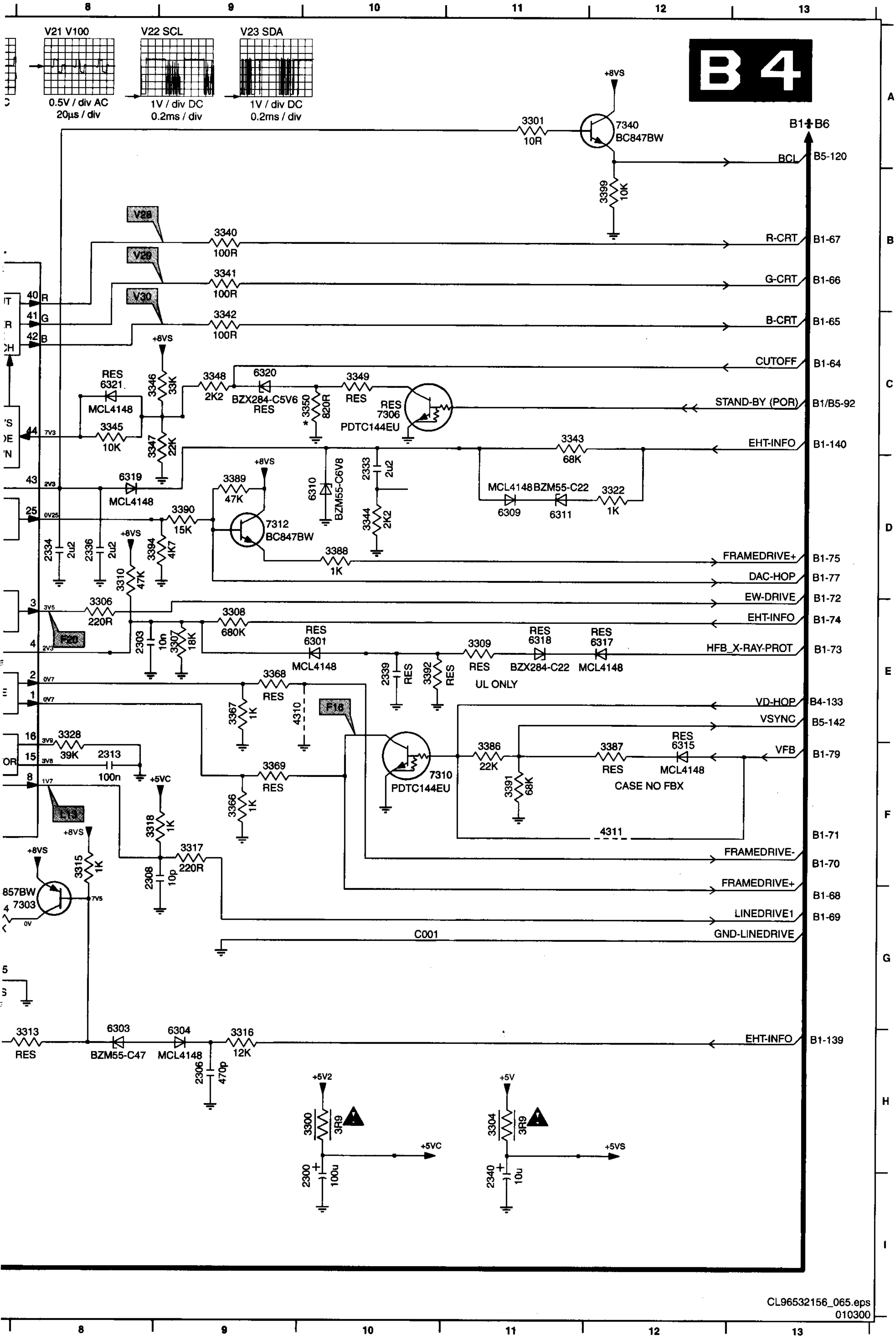
Item	Location
1701	J4
2702	B4
2703	C3
2704	C4
2706	C1
2707	C2
2708	C3
2709	C3
2710	C4
2712	D2
2713	D10
2717	F2
2718	F2
2719	F2
2720	F2
2721	G2
2723	G2
2724	G2
2725	G2
2726	G2
2728	B14
2729	I1
2730	H4
2731	I1
2733	J2
2738	J2
2743	J2
2747	J3
2748	J4
2755	B8
2756	E2
2757	C2
2758	E13
2759	E13
2760	E14
2761	E14
2762	E14
2763	E14
2764	E14
2765	E14
2766	I4
2767	K8
2770	D1
2771	G4
2772	H4
2773	I4
2774	J11
2776	D7
2785	D9
2786	I11
2788	E11
2790	D14
2792	D11
2795	B3
2796	K6
2797	J12
2798	I4
3702	J11
3703	F4
3704	D8
3705	F4
3706	D8
3707	D4
3708	E2
3709	E4
3710	F3
3711	E3
3712	F3
3713	G3
3714	I2
3716	H2
3717	I2
3718	H4
3719	C2
3720	C2
3721	B2
3722	B2
3725	J4
3728	K2
3730	K3
3731	K4
3732	K4
3733	K2
3739	J11
3740	E3
3741	D3
3744	E3
3745	D3
3746	H13
3747	F2
3748	F2
3749	G2
3754	I2
3755	J2
3757	J2
3759	J2
3790-A	B11
3790-B	B11
3790-C	C11
3790-D	C11
3791-A	B11
3791-B	B11
3791-C	B11
3791-D	B11
3792-A	B11
3792-B	A11
3792-C	A11
3792-D	A11
3793-A	G11
3793-B	G11
3793-C	G11
3793-D	G11
3794-A	G11
3794-B	G11
3794-C	H11
3794-D	H11
3795-A	H11
3795-B	H11
3795-C	H11
3795-D	I11
3796	G11
3797	C11
3798	B2
4703	F4
4707-A	A15
4707-B	A15
4707-C	B15
4707-D	B15
4708-A	B15
4708-B	B15
4708-C	C15
4708-D	C15
4709-A	C15
4709-B	C15
4709-C	D15
4709-D	D15
4710	D15
4711	E4
4720	A9
4721	A9
4722	D9
4723	D10
4724	A11
4725	A11
4726	D11
4728	H13
4731	C11
4732	D11
4733	A13
4734	A14
4735	A11
4736	A11
4790	D9
4791	D13
4792	C13
4793	D13
5701	A3
5702	B3
5703	C1
5704	C2
5705	C3
5706	D2
5707	H2
5708	F2
5709	G2
5710	G2
5711	D10
5713	A14
5715	D9
5716	D11
5717	D12
5718	H4
5720	B8
7701	D2
7702	E3
7704	H2
7708	F13
7709	E5
7713	B2
7714	A10
7715	A12
7716	B7

Diversity Small Signal Panel (B3)

Item	*100HZ INCR ST*	*DS VIRT DLB*	*100HZ DLB*
2728	-	100N	-
2758	-	100N	-
2759	-	100N	-
2760	-	100N	-
2761	-	100N	-
2762	-	100N	-
2763	-	100N	-
2764	-	100N	-
2765	-	100N	-
2790	-	100N	-
3793	10R	100R	10R
3794	10R	100R	10R
3795	10R	100R	10R
3796	10R	100R	10R
4707	10R	-	10R
4708	10R	-	10R
4709	10R	-	10R
4710	JUMP	-	JUMP
4734	-	JUMP	-
4792	-	JUMP	-
4793	-	JUMP	-
5713	-	FXDIND	-
7708	-	SAA4990H	-
7715	-	MSM54V12222A-30JS	-

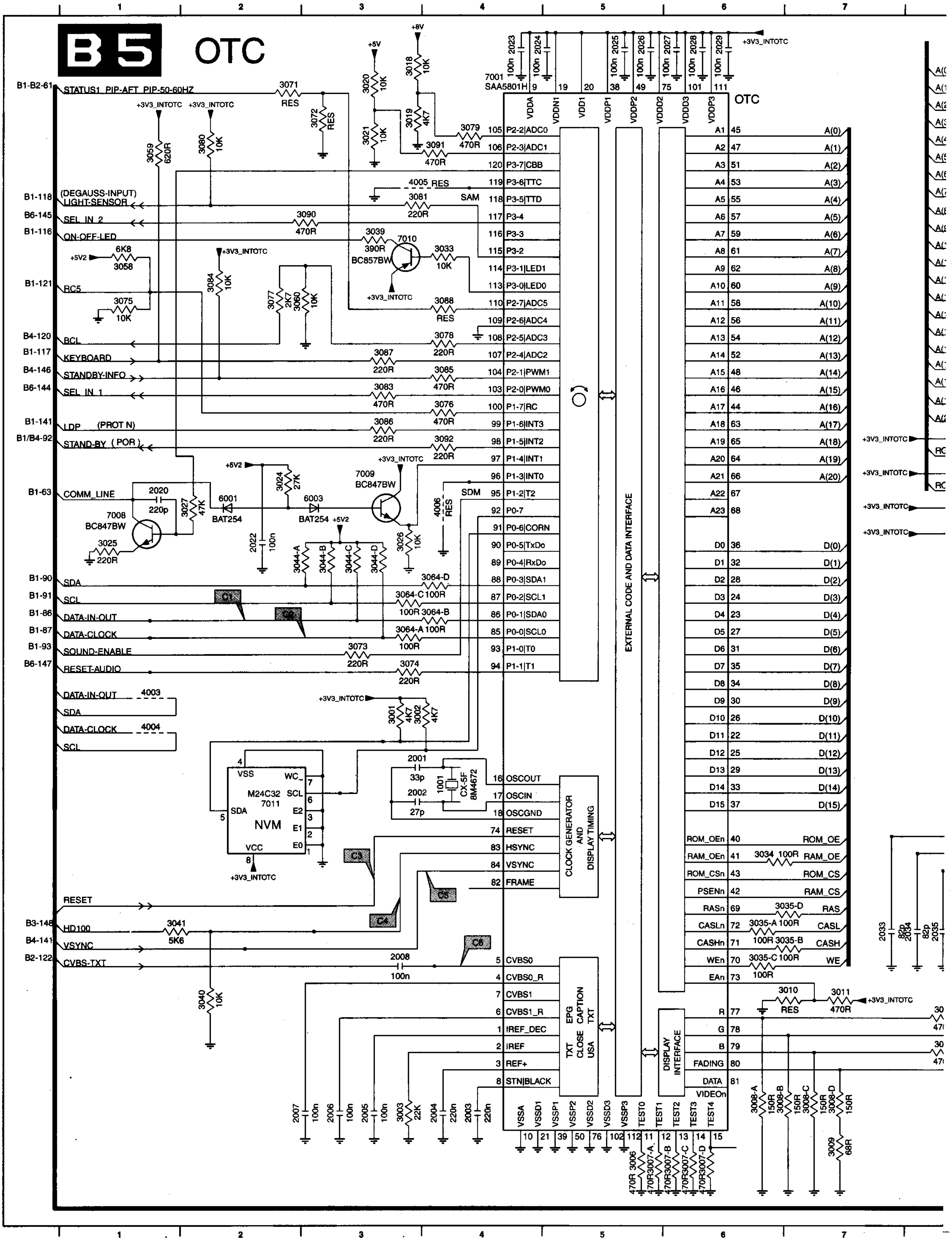
HOP

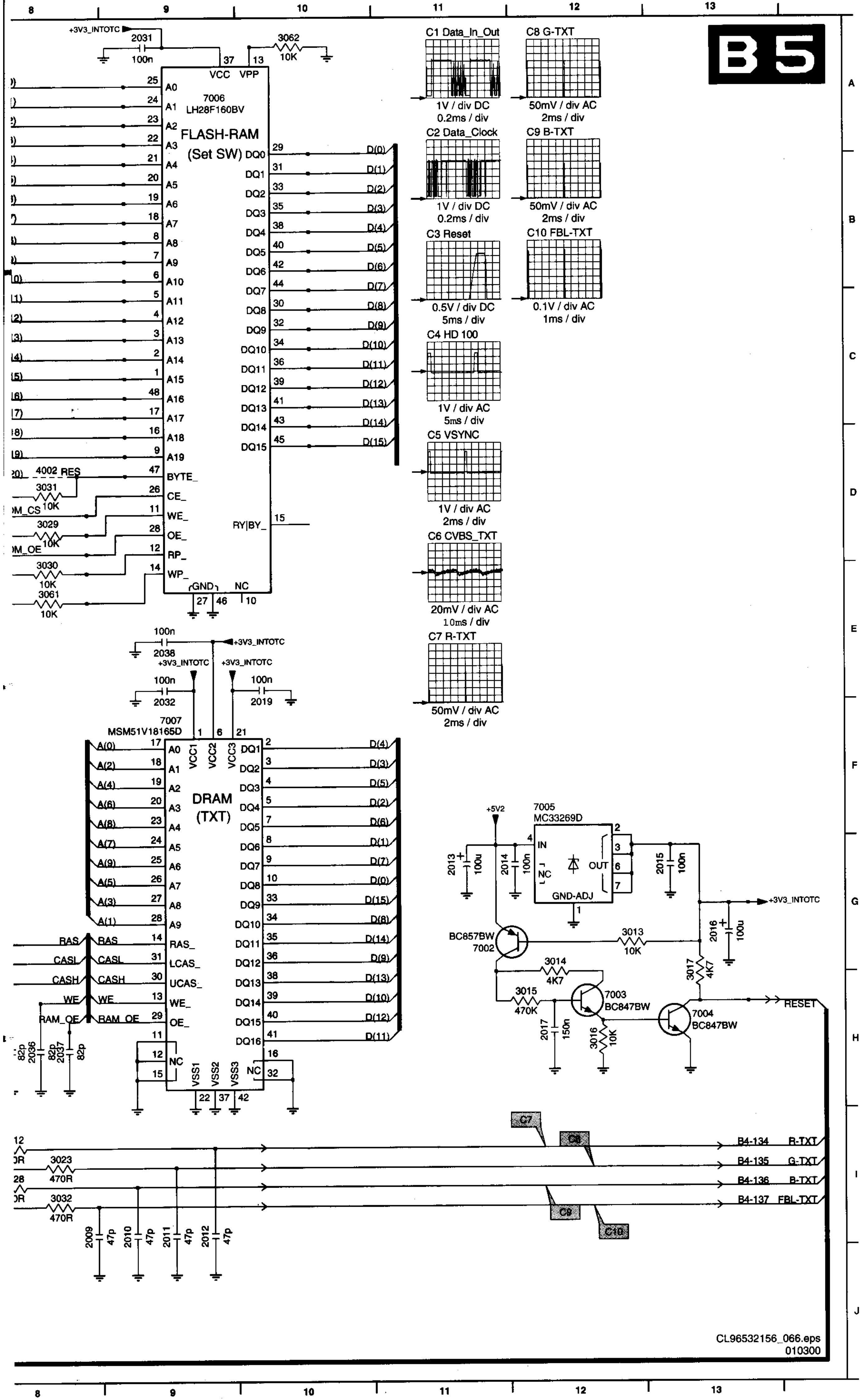

B 4 HOP
V19 Y100
0.5V / div AC
20µs / div
V20 U100
0.5V / div A
20µs / div
F18 Frame Drive +
0.2V / div AC
2ms / div
F20 EW-Drive
0.2V / div AC
2ms / div
L13 Line Drive 1
1V / div AC
5ms / div
S9 VDHOP
2V / div DC
5ms / div
S10 HD100
2V / div DC
50µs / div
FOCUS-R
FOCUS-G
FOCUS-B
FOCUS-FBL
HD100
FOCUS-V
(NOT USED)
B5-134 R-TXT
G-TXT
B5-135 B-TXT
B5-136 FBL-TXT
B5-137
2329
2330 100n
2331 100n
100n
2328 22p
7301 TDA9330H
V21
V20
V19
Y100
U100
V100
FOCUS-FBL
2323 100n
2322 100n
2321 100n
3395 100R
4301
SWITCH
SATUR'N CONTROL COLOUR DIFF MATRIX
CONTRAST AND BRIGHTNESS CONTROL
RGB-INSERTION
WHITE POINT CONTROL
OUTPU AMPL + BUFFE + BLUE STRETC
SAT
CONTR
BRIGHT
WHITE P.
BLACK STRETCH
PWL + BEAM CURR LIMITER
CONTIN CATHOD CALIBR
6-BITS DAC
RGB-YUV MATRIX
3396 100R
3397 100R
3398 100R
2395 100n
2396 100n
2397 100n
SCL
SDA
3320 100R
3321 100R
2309 RES
2310 RES
V22
V23
I²C
HOP
EW
FRAM
RAMP GENERAT
+8V
3329 6R8
+8VG
+8VS
5301 6u8
5302 6u8
2341 100u
2314 100u
2315 100n
2332 100n
2317 2u2
2318 22n
2307 100n
SYNC+GEO
RGB
BANDGAP
ANAGND
DIGSUP
DIGGND
SUPPLY
VD-HOP
3363 1K
S9
S10
S11
PHI-1 Hsel
PHI-2 SC
START/STOP H-DRIVE
+5VS
3365 4K7
3364 68K
3362 10K
2338 10n
7311 BC847BW
7309 PDTC144EU
3332 RES
2319 10n
3330 3K3
VD100
FOCUS-V
7330 PDTC144EU
HD100
3333 1K
3331 1K
2320 10p
4306 1fh ONLY
1301
CSTCV
14M74
3319 RES
RES 6305
MCL4148
2325 100n
+8VG
3325 RES
3326 RES
3327 100K
6334 MCL4148
3334 2K2
3323 RES
2311 RES
3324 2K2
6306 BZM55-C5V6
6307 1PS76SB10
2398 10n
3336 1K
3337 1K8
2324 10n
2335 47u
+5VC
7324 BC847CW
3335 3K3
3338 6K8
7308 PDTC144EU
3311 100K
2304 10p
6302 MCL4148 RES
3312 RES
VFB
HFB_X-RAY-PROT
DYN-FASE-COR
STAND-BY (POR)
STANDBY-INFO
LDP
B1-79
B1-76
B1/B5-92
B5-146
B1-78
1
2
3
4
5
6
7


B 4
8
9
10
11
12
13
V21 V100
0.5V / div AC
20µs / div
V22 SCL
1V / div DC
0.2ms / div
V23 SDA
1V / div DC
0.2ms / div
+8VS
3301
10R
7340
BC847BW
3399
10K
B1÷B6
BCL
B5-120
V28
V29
V30
3340
100R
3341
100R
3342
100R
R-CRT
B1-67
G-CRT
B1-66
B-CRT
B1-65
40 R
41 G
42 B
CUTOFF
B1-64
RES
6321
MCL4148
3346
33K
3348
2K2
6320
BZX284-C5V6
RES
3350
820R
3349
RES
RES
7306
PDTC144EU
STAND-BY (POR)
B1/B5-92
3345
10K
44 7V3
3347
22K
EHT-INFO
B1-140
3343
68K
6310
BZM55-C6V8
2333
2u2
3344
2K2
MCL4148
6309
BZM55-C22
6311
3322
1K
43 2V3
6319
MCL4148
3389
47K
25 0V25
3390
15K
7312
BC847BW
3394
4K7
2334
2u2
2336
2u2
3310
47K
3388
1K
FRAMEDRIVE+
B1-75
DAC-HOP
B1-77
EW-DRIVE
B1-72
3 3V5
3306
220R
F20
3308
680K
EHT-INFO
B1-74
4 2V3
2303
10n
3307
18K
RES
6301
MCL4148
2339
RES
3392
RES
3309
RES
UL ONLY
RES
6318
BZX284-C22
RES
6317
MCL4148
HFB_X-RAY-PROT
B1-73
2 0V7
1 0V7
3368
RES
3367
1K
4310
F18
VD-HOP
B4-133
VSYNC
B5-142
16 3V9
3328
39K
15 3V8
2313
100n
7310
PDTC144EU
3386
22K
3387
RES
RES
6315
MCL4148
CASE NO FBX
VFB
B1-79
3391
68K
8 1V7
+5VC
3369
RES
3366
1K
3318
1K
L13
4311
B1-71
FRAMEDRIVE-
B1-70
3317
220R
2308
10p
3315
1K
7V5
857BW
7303
0V
FRAMEDRIVE+
B1-68
LINEDRIVE1
B1-69
C001
GND-LINEDRIVE
3313
RES
6303
BZM55-C47
6304
MCL4148
2306
470p
3316
12K
EHT-INFO
B1-139
+5V2
3300
3R9
+5VC
2300
100u
+5V
3304
3R9
+5VS
2340
10u
A
B
C
D
E
F
G
H
I
CL96532156_065.eps
010300

1301	G4
2300	I10
2303	E8
2304	G7
2305	G7
2306	H9
2307	E3
2308	F8
2309	D3
2310	D3
2311	H5
2313	F8
2314	E2
2315	E2
2317	E3
2318	E3
2319	G2
2320	H3
2321	C3
2322	C3
2323	B3
2324	G6
2325	G5
2328	B7
2329	B6
2330	B6
2331	B6
2332	E2
2333	D10
2334	D8
2335	G6
2336	D8
2338	F2
2339	E10
2340	I11
2341	E1
2395	C3
2396	C2
2397	C3
2398	F5
3300	H10
3301	A11
3304	H11
3306	E8
3307	E9
3308	E9
3309	E11
3310	D8
3311	G7
3312	G7
3313	H8
3314	G7
3315	F8
3316	H9
3317	F9
3318	F8
3319	F4
3320	D2
3321	D2
3322	D12
3323	H5
3324	H4
3325	G5
3326	G5
3327	G5
3328	E8
3329	E1
3330	G2
3331	H3
3332	G2
3333	H3
3334	H4
3335	G6
3336	F5
3337	G5
3338	G6
3340	B9
3341	B9
3342	C9
3343	C11
3344	D10
3345	C8
3346	C8
3347	C8
3348	C9
3349	C10
3350	C10
3362	F2
3363	F3
3364	F2
3365	F1
3366	F9
3367	E9
3368	E9
3369	F9
3386	F11
3387	F12
3388	D10
3389	D9
3390	D9
3391	F11
3392	E10
3394	D8
3395	C3
3396	C2
3397	C2
3398	C2
3399	B12
4301	C3
4306	G3
4310	E10
4311	F12
5301	E2
5302	E2
6301	E10
6302	G7
6303	H8
6304	H9
6305	G4
6306	H5
6307	H5
6309	D11
6310	D10
6311	D11
6315	F12
6317	E12
6318	E11
6319	D8
6320	C9
6321	C8
6334	H4
7301	B3
7303	G8
7306	C10
7308	H6
7309	F3
7310	F11
7311	F1
7312	D9
7324	G6
7330	G2
7340	A12
C001	G10

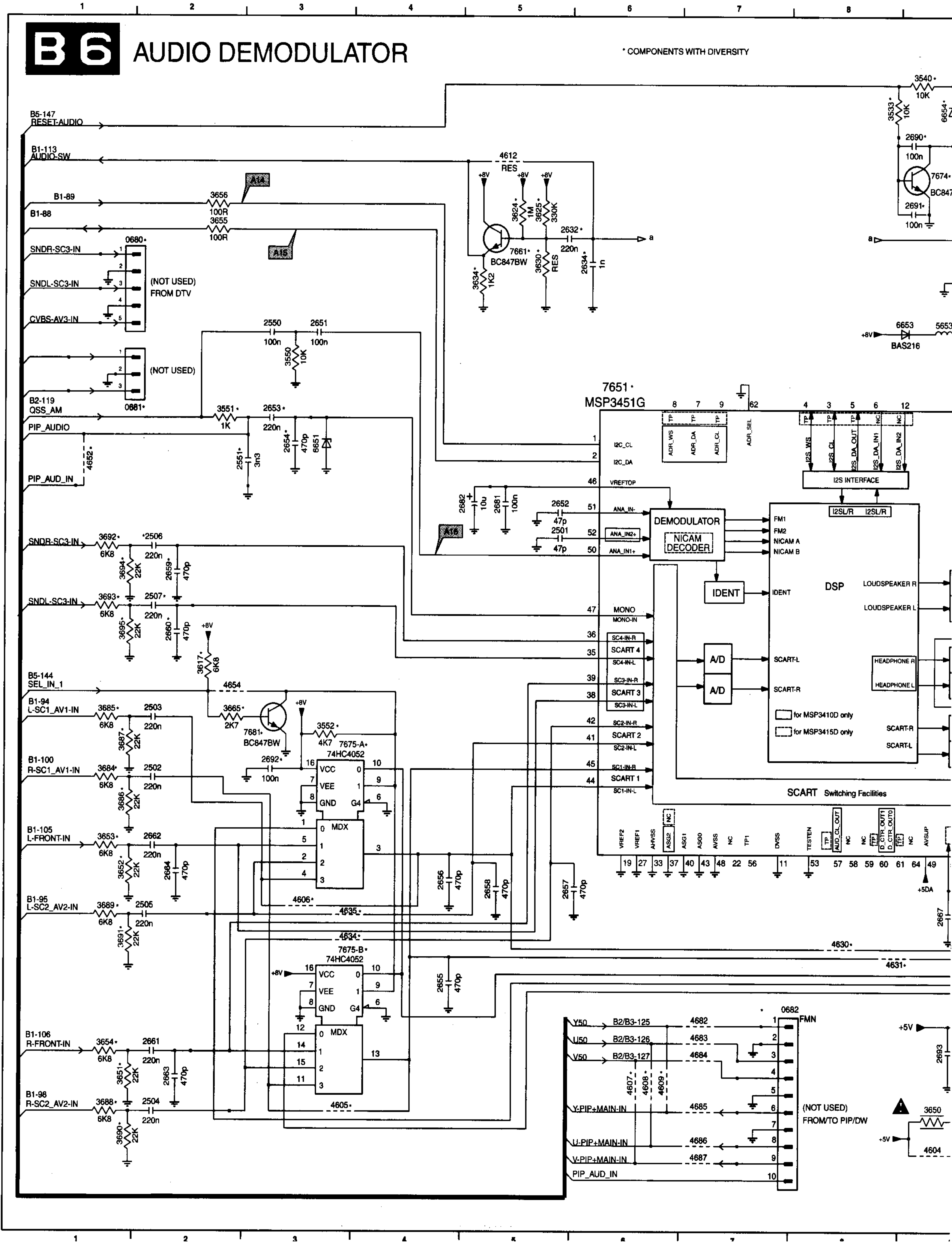
OTC

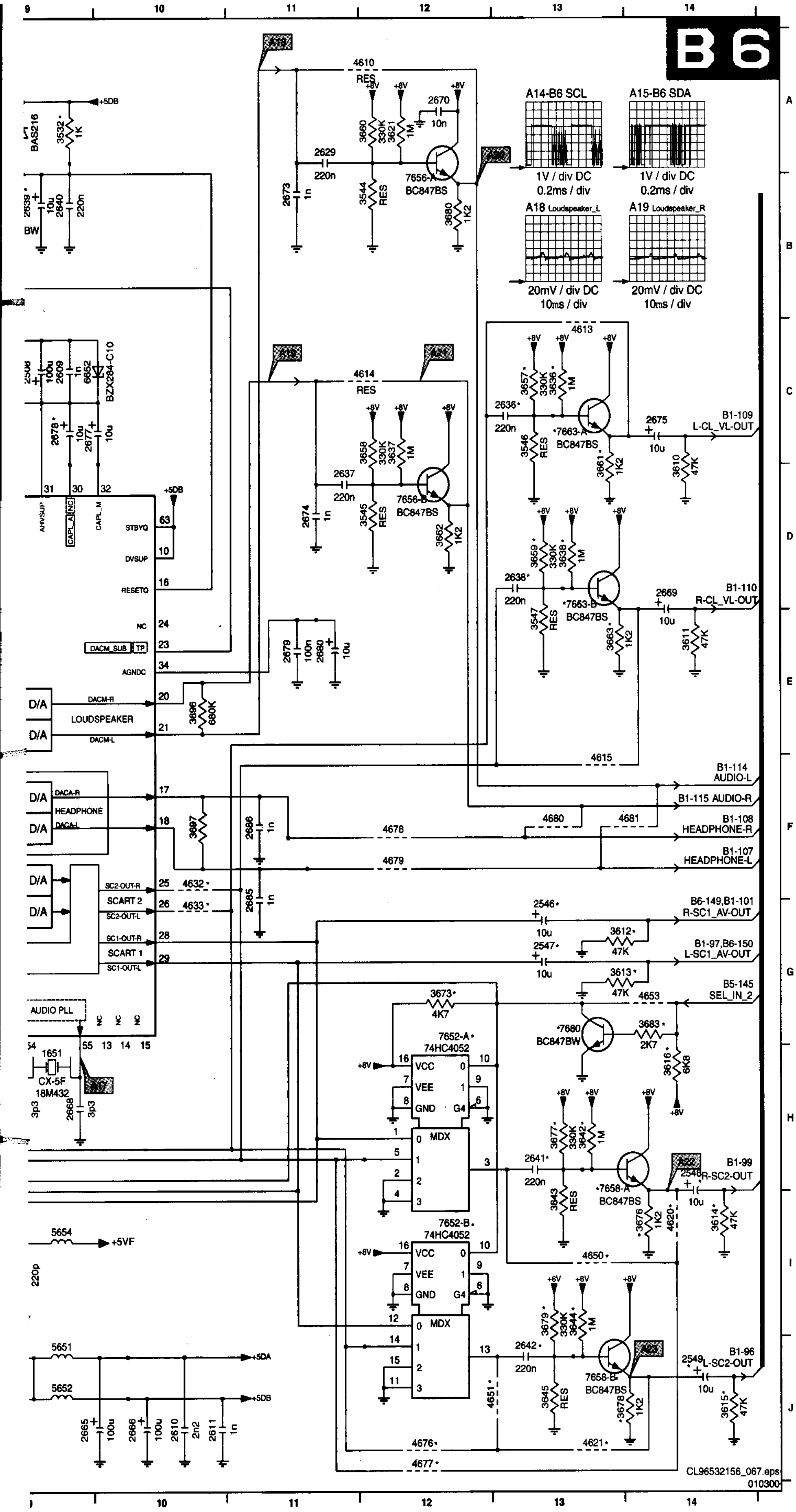

B5
OTC
7001
SAA5801H
OTC
B1-B2-61 STATUS1 PIP-AFT PIP-50-60HZ
B1-118 (DEGAUSS-INPUT) LIGHT-SENSOR
B6-145 SEL_IN_2
B1-116 ON-OFF-LED
B1-121 RC5
B4-120 BCL
B1-117 KEYBOARD
B4-146 STANDBY-INFO
B6-144 SEL_IN_1
B1-141 LDP (PROT N)
B1/B4-92 STAND-BY (POR)
B1-63 COMM_LINE
B1-90 SDA
B1-91 SCL
B1-86 DATA-IN-OUT
B1-87 DATA-CLOCK
B1-93 SOUND-ENABLE
B6-147 RESET-AUDIO
DATA-IN-OUT 4003
SDA
DATA-CLOCK 4004
SCL
RESET
B3-148 HD100
B4-141 VSYNC
B2-122 CVBS-TXT
+3V3_INTOTC
+5V
+8V
+5V2
3071 RES
3072 RES
3059 620R
3080 10K
3020 10K
3021 10K
3018 10K
3019 4K7
3079 470R
3091 470R
4005 RES
3081 220R
SAM
3090 470R
3039 390R
7010 BC857BW
3033 10K
6K8 3058
3075 10K
3084 10K
3077 2K7
3060 10K
3088 RES
3078 220R
3087 220R
3085 470R
3083 470R
3076 470R
3086 220R
3092 220R
7009 BC847BW
3024 27K
2020 220p
7008 BC847BW
3027 47K
6001 BAT254
6003 BAT254
3025 220R
2022 100n
3044-A 3044-B 3044-C 3044-D
3026 10K
4006 RES
SDM
3064-D
3064-C 100R
100R 3064-B
3064-A 100R
3073 220R
100R
3074 220R
3001 4K7
3002 4K7
VSS WC_ M24C32 7011 SCL SDA E2 E1 E0 NVM VCC
2001 33p
2002 27p
1001 CX-5F 8M4672
3041 5K6
2008 100n
3040 10K
2007 100n 2006 100n 2005 100n 3003 22K 2004 220n 2003 220n
C1 C2 C3 C4 C5 C6
100n 2023 100n 2024 100n 2025 100n 2026 100n 2027 100n 2028 100n 2029
9 19 20 38 49 75 101 111
VDDA VDDN1 VDD1 VDDP1 VDDP2 VDDD2 VDDD3 VDDP3
105 P2-2|ADC0
106 P2-3|ADC1
120 P3-7|CBB
119 P3-6|TTC
118 P3-5|TTD
117 P3-4
116 P3-3
115 P3-2
114 P3-1|LED1
113 P3-0|LED0
110 P2-7|ADC5
109 P2-6|ADC4
108 P2-5|ADC3
107 P2-4|ADC2
104 P2-1|PWM1
103 P2-0|PWM0
100 P1-7|RC
99 P1-6|INT3
98 P1-5|INT2
97 P1-4|INT1
96 P1-3|INT0
95 P1-2|T2
92 P0-7
91 P0-6|CORN
90 P0-5|TxDo
89 P0-4|RxDo
88 P0-3|SDA1
87 P0-2|SCL1
86 P0-1|SDA0
85 P0-0|SCL0
93 P1-0|T0
94 P1-1|T1
16 OSCOUT
17 OSCIN
18 OSCGND
74 RESET
83 HSYNC
84 VSYNC
82 FRAME
5 CVBS0
4 CVBS0_R
7 CVBS1
6 CVBS1_R
1 IREF_DEC
2 IREF
3 REF+
8 STN|BLACK
EXTERNAL CODE AND DATA INTERFACE
CLOCK GENERATOR AND DISPLAY TIMING
EPG CAPTION TXT TXT CLOSE USA
DISPLAY INTERFACE
VSSA VSSD1 VSSP1 VSSP2 VSSD2 VSSD3 VSSP3 TEST0 TEST1 TEST2 TEST3 TEST4
10 21 39 50 76 102 112 11 12 13 14 15
470R 3006 470R3007-A 470R3007-B 470R3007-C 470R3007-D
A1 45 A(0)
A2 47 A(1)
A3 51 A(2)
A4 53 A(3)
A5 55 A(4)
A6 57 A(5)
A7 59 A(6)
A8 61 A(7)
A9 62 A(8)
A10 60 A(9)
A11 58 A(10)
A12 56 A(11)
A13 54 A(12)
A14 52 A(13)
A15 48 A(14)
A16 46 A(15)
A17 44 A(16)
A18 63 A(17)
A19 65 A(18)
A20 64 A(19)
A21 66 A(20)
A22 67
A23 68
D0 36 D(0)
D1 32 D(1)
D2 28 D(2)
D3 24 D(3)
D4 23 D(4)
D5 27 D(5)
D6 31 D(6)
D7 35 D(7)
D8 34 D(8)
D9 30 D(9)
D10 26 D(10)
D11 22 D(11)
D12 25 D(12)
D13 29 D(13)
D14 33 D(14)
D15 37 D(15)
ROM_OEn 40 ROM_OE
RAM_OEn 41 3034 100R RAM_OE
ROM_CSn 43 ROM_CS
PSENn 42 RAM_CS
RASn 69 3035-D RAS
CASLn 72 3035-A 100R CASL
CASHn 71 100R 3035-B CASH
WEn 70 3035-C 100R WE
EAn 73 100R
R 77
G 78
B 79
FADING 80
DATA 81
VIDEOn
3010 RES
3011 470R
3008-A 150R 3008-B 150R 3008-C 150R 3008-D 150R
3009 68R
2033 82p 2034 82p 2035
1 2 3 4 5 6 7


B5
8
9
10
11
12
13
+3V3_INTOTC
2031
100n
3062
10K
37
13
VCC
VPP
7006
LH28F160BV
FLASH-RAM
(Set SW)
A0
A1
A2
A3
A4
A5
A6
A7
A8
A9
A10
A11
A12
A13
A14
A15
A16
A17
A18
A19
BYTE_
CE_
WE_
OE_
RP_
WP_
GND
NC
RY|BY_
DQ0
DQ1
DQ2
DQ3
DQ4
DQ5
DQ6
DQ7
DQ8
DQ9
DQ10
DQ11
DQ12
DQ13
DQ14
DQ15
D(0)
D(1)
D(2)
D(3)
D(4)
D(5)
D(6)
D(7)
D(8)
D(9)
D(10)
D(11)
D(12)
D(13)
D(14)
D(15)
4002 RES
3031
10K
OM_CS
3029
10K
OM_OE
3030
10K
3061
10K
C1 Data_In_Out
1V / div DC
0.2ms / div
C2 Data_Clock
1V / div DC
0.2ms / div
C3 Reset
0.5V / div DC
5ms / div
C4 HD 100
1V / div AC
5ms / div
C5 VSYNC
1V / div AC
2ms / div
C6 CVBS_TXT
20mV / div AC
10ms / div
C7 R-TXT
50mV / div AC
2ms / div
C8 G-TXT
50mV / div AC
2ms / div
C9 B-TXT
50mV / div AC
2ms / div
C10 FBL-TXT
0.1V / div AC
1ms / div
100n
2038
+3V3_INTOTC
100n
2032
100n
2019
7007
MSM51V18165D
DRAM
(TXT)
VCC1
VCC2
VCC3
A(0)
A(2)
A(4)
A(6)
A(8)
A(7)
A(9)
A(5)
A(3)
A(1)
RAS
CASL
CASH
WE
RAM_OE
RAS_
LCAS_
UCAS_
WE_
OE_
NC
VSS1
VSS2
VSS3
DQ1
DQ2
DQ3
DQ4
DQ5
DQ6
DQ7
DQ8
DQ9
DQ10
DQ11
DQ12
DQ13
DQ14
DQ15
DQ16
82p
2036
82p
2037
+5V2
7005
MC33269D
IN
NC
OUT
GND-ADJ
2013
100u
2014
100n
2015
100n
2016
100u
BC857BW
7002
3013
10K
3014
4K7
3015
470K
2017
150n
3016
10K
3017
4K7
7003
BC847BW
7004
BC847BW
RESET
C7
C8
C9
C10
3023
470R
3032
470R
2009
47p
2010
47p
2011
47p
2012
47p
B4-134
R-TXT
B4-135
G-TXT
B4-136
B-TXT
B4-137
FBL-TXT
CL96532156_066.eps
010300
A
B
C
D
E
F
G
H
I
J

1001	G4
2001	G3
2002	G3
2003	J4
2004	J4
2005	J3
2006	J3
2007	J2
2008	H3
2009	I8
2010	I9
2011	I9
2012	I9
2013	G11
2014	G11
2015	G13
2016	G13
2017	H12
2019	E10
2020	D1
2022	E2
2023	A4
2024	A4
2025	A5
2026	A5
2027	A6
2028	A6
2029	A6
2031	A9
2032	E9
2033	H7
2034	H8
2035	H8
2036	H8
2037	H8
2038	E9
3001	F3
3002	F3
3003	J3
3006	J5
3007-A	J5
3007-B	J6
3007-C	J6
3007-D	J6
3008-A	I6
3008-B	I6
3008-C	I7
3008-D	I7
3009	J7
3010	I7
3011	I7
3012	I8
3013	G12
3014	G12
3015	H12
3016	H12
3017	G13
3018	A3
3019	A3
3020	A3
3021	A3
3023	I8
3024	D2
3025	E1
3026	E3
3027	E2
3028	I8
3029	D8
3030	E8
3031	D8
3032	I8
3033	B4
3034	G6
3035-A	H6
3035-B	H7
3035-C	H6
3035-D	H7
3039	B3
3040	I2
3041	H1
3044-A	E2
3044-B	E3
3044-C	E3
3044-D	E3
3058	C1
3059	B1
3060	C2
3061	E8
3062	A10
3064-A	F3
3064-B	E4
3064-C	E3
3064-D	E4
3071	A2
3072	A3
3073	F3
3074	F3
3075	C1
3076	D4
3077	C2
3078	C4
3079	A4
3080	B2
3081	B3
3083	D3
3084	C2
3085	C4
3086	D3
3087	C3
3088	C4
3090	B3
3091	B4
3092	D4
4002	D8
4003	F1
4004	F1
4005	B3
4006	E4
6001	E2
6003	E3
7001	A4
7002	G11
7003	H12
7004	H13
7005	F12
7006	A9
7007	F9
7008	E1
7009	D3
7010	B3
7011	G2

Audio demodulator


B6 AUDIO DEMODULATOR
* COMPONENTS WITH DIVERSITY
B5-147 RESET-AUDIO
B1-113 AUDIO-SW
B1-89
B1-88
SNDR-SC3-IN
SNDL-SC3-IN
CVBS-AV3-IN
0680*
(NOT USED) FROM DTV
(NOT USED)
0681*
B2-119 QSS_AM
PIP_AUDIO
PIP_AUD_IN
B5-144 SEL_IN_1
B1-94 L-SC1_AV1-IN
B1-100 R-SC1_AV1-IN
B1-105 L-FRONT-IN
B1-95 L-SC2_AV2-IN
B1-106 R-FRONT-IN
B1-98 R-SC2_AV2-IN
4612 RES
7661* BC847BW
7681* BC847BW
7675-A* 74HC4052
7675-B* 74HC4052
VCC
VEE
GND
MDX
7651* MSP3451G
I2C_CL
I2C_DA
VREFTOP
ANA_IN-
ANA_IN2+
ANA_IN1+
DEMODULATOR
NICAM DECODER
IDENT
DSP
FM1
FM2
NICAM A
NICAM B
I2S INTERFACE
I2SL/R
LOUDSPEAKER R
LOUDSPEAKER L
HEADPHONE R
HEADPHONE L
SCART-L
SCART-R
A/D
MONO
MONO-IN
SCART 4
SCART 3
SCART 2
SCART 1
for MSP3410D only
for MSP3415D only
SCART Switching Facilities
ADR_WS
ADR_DA
ADR_CL
ADR_SEL
I2S_WS
I2S_CL
I2S_DA_OUT
I2S_DA_IN1
I2S_DA_IN2
7674* BC847
6653 BAS216
0682 FMN
Y50 B2/B3-125
U50 B2/B3-126
V50 B2/B3-127
Y-PIP+MAIN-IN
U-PIP+MAIN-IN
V-PIP+MAIN-IN
PIP_AUD_IN
(NOT USED) FROM/TO PIP/DW
3650
4604
A14
A15
A16


B6
A14-B6 SCL
A15-B6 SDA
1V / div DC
0.2ms / div
A18 Loudspeaker_L
A19 Loudspeaker_R
20mV / div DC
10ms / div
7656-A BC847BS
7656-B BC847BS
7663-A BC847BS
7663-B BC847BS
7658-A BC847BS
7658-B BC847BS
7680 BC847BW
7652-A 74HC4052
7652-B 74HC4052
MDX
VCC
VEE
GND
B1-109 L-CL_VL-OUT
B1-110 R-CL_VL-OUT
B1-114 AUDIO-L
B1-115 AUDIO-R
B1-108 HEADPHONE-R
B1-107 HEADPHONE-L
B6-149,B1-101 R-SC1_AV-OUT
B1-97,B6-150 L-SC1_AV-OUT
B5-145 SEL_IN_2
B1-99 R-SC2-OUT
B1-96 L-SC2-OUT
D/A
LOUDSPEAKER
HEADPHONE
SCART 2
SCART 1
AUDIO PLL
DACM-R
DACM-L
DACA-R
DACA-L
SC2-OUT-R
SC2-OUT-L
SC1-OUT-R
SC1-OUT-L
STBYQ
DVSUP
RESETQ
NC
DACM_SUB
TP
AGNDC
AHVSUP
CAPL_A
CAPL_M
BAS216
BZX284-C10
1651 CX-5F 18M432
+5DB
+5DA
+5VF
+8V
5651
5652
5654
4610 RES
4614 RES
4613
4615
4650
4676
4677
4678
4679
4680
4681
4621
4651
4632
4633
A13
A21
A22
A23
A17
CL96532156_067.eps
010300
9
10
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12
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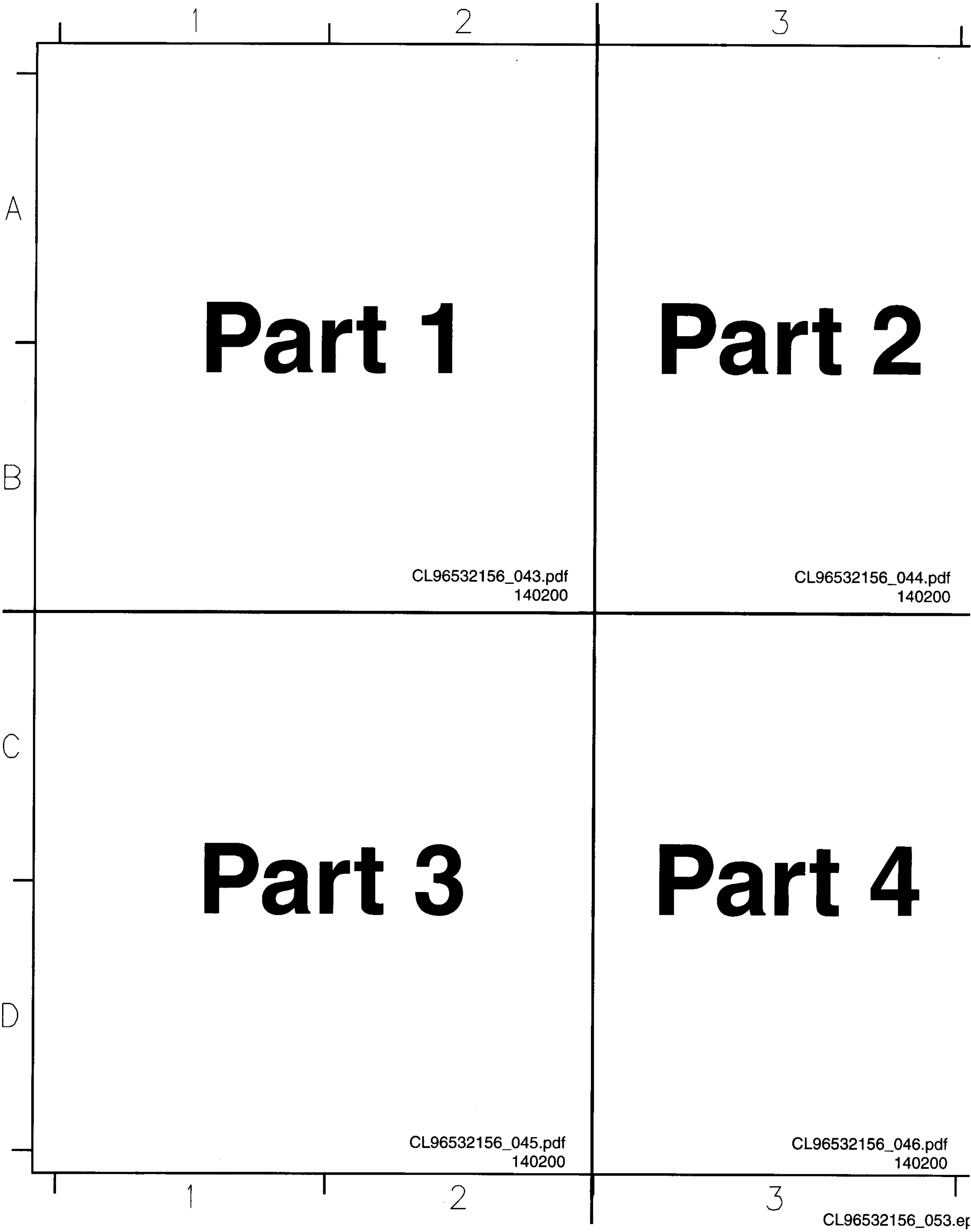
14
A
B
C
D
E
F
G
H
I
J

0680 B1	3645 J13	7681 F3
0681 D1	3650 J9	
0682 I7	3651 I1	
1651 H9	3652 H1	
2501 E5	3653 G1	
2502 G2	3654 I1	
2503 F2	3655 B2	
2504 J2	3656 B2	
2505 H2	3657 C13	
2506 E2	3658 C12	
2507 E2	3659 D13	
2508 C9	3660 A12	
2546 G13	3661 C13	
2547 G13	3662 D12	
2548 H14	3663 E13	
2549 J14	3665 F2	
2550 C3	3673 G12	
2551 D2	3676 I14	
2609 C9	3677 H13	
2610 J10	3678 J13	
2611 J10	3679 I13	
2629 A11	3680 B12	
2632 B5	3683 G14	
2634 B6	3684 G1	
2636 C13	3685 F1	
2637 D11	3686 G1	
2638 D13	3687 F1	
2639 B9	3688 J1	
2640 B9	3689 H1	
2641 H13	3690 J1	
2642 J13	3691 H1	
2651 C3	3692 E1	
2652 E5	3693 E1	
2653 D3	3694 E1	
2654 D3	3695 F1	
2655 H4	3696 E10	
2656 H4	3697 F10	
2657 H5	4604 J9	
2658 H5	4605 J3	
2659 E2	4606 H3	
2660 F2	4607 I6	
2661 I2	4608 I6	
2662 G2	4609 I6	
2663 I2	4610 A12	
2664 H2	4612 B5	
2665 J9	4613 B13	
2666 J10	4614 C12	
2667 H9	4615 F13	
2668 H9	4620 I14	
2669 D14	4621 J13	
2670 A12	4630 H8	
2673 B11	4631 H8	
2674 D11	4632 F10	
2675 C14	4633 G10	
2677 C9	4634 H3	
2678 C9	4635 H3	
2679 E11	4650 I13	
2680 E11	4651 J13	
2681 D5	4652 D1	
2682 D5	4653 G14	
2685 F11	4654 F2	
2686 F11	4676 J12	
2690 A9	4677 J12	
2691 B9	4678 F12	
2692 G3	4679 F12	
2693 I9	4680 F13	
3532 A9	4681 F14	
3533 A8	4682 I7	
3540 A9	4683 I7	
3544 B12	4684 I7	
3545 D12	4685 J7	
3546 C13	4686 J7	
3547 E13	4687 J7	
3550 C3	5651 J9	
3551 D2	5652 J9	
3552 F3	5653 C9	
3610 C14	5654 I9	
3611 E14	6651 D3	
3612 G13	6652 C9	
3613 G13	6653 C9	
3614 I14	6654 A9	
3615 J14	7651 D6	
3616 H14	7652-A G12	
3617 F2	7652-B I12	
3621 A12	7656-A B12	
3624 B5	7656-B D12	
3625 B5	7658-A I13	
3630 B5	7658-B J13	
3634 C5	7661 B5	
3636 C13	7663-A C13	
3637 C12	7663-B D13	
3638 D13	7674 B9	
3642 H13	7675-A G4	
3643 I13	7675-B H4	
3644 I13	7680 G13	

Diversity Small Signal Panel (B6)			
Item	100HZ INCR ST	DS VIRT DLB	100HZ DLB
2636	220N	-	-
2638	220N	-	-
2641	220N	-	-
2642	220N	-	-
2663	-	470P	470P
2664	-	470P	470P
2677	2U2	10U	10U
2678	-	10U	10U
2678	-	10U	10U
2685	-	1N	1N
2686	-	1N	1N
2692	100N	-	-
3552	4K7	-	-
3617	6K8	-	-
3636	1M	-	-
3638	1M	-	-
3642	1M	-	-
3644	1M	-	-
3657	330K	-	-
3659	330K	-	-
3661	1K2	-	-
3663	1K2	-	-
3665	2K7	-	-
3676	1K2	-	-
3677	330K	-	-
3678	1K2	-	-
3679	330K	-	-
4605	-	JUMP	JUMP
4606	-	JUMP	JUMP
4613	-	JUMP	JUMP
4615	-	JUMP	JUMP
4620	-	JUMP	JUMP
4621	-	JUMP	JUMP
4630	JUMP	-	-
4631	JUMP	-	-
4632	-	JUMP	JUMP
4633	-	JUMP	JUMP
4634	-	JUMP	JUMP
4635	-	JUMP	JUMP
4650	-	JUMP	JUMP
4651	-	JUMP	JUMP
4678	-	JUMP	JUMP
4679	-	JUMP	JUMP
4680	JUMP	-	-
4681	JUMP	-	-
7651	MSP3415D-FH-B3	MSP3451G-FH-A1	MSP3451G-FH-A1
7658	BC847BS	-	-
7663	BC847BS	-	-
7675	74HC4052PW	-	-
7681	BC847BW	-	-

SSP (LOT side overview)


1
2
3
A
B
C
D
Part 1
Part 2
Part 3
Part 4
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140200
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CL96532156_046.pdf
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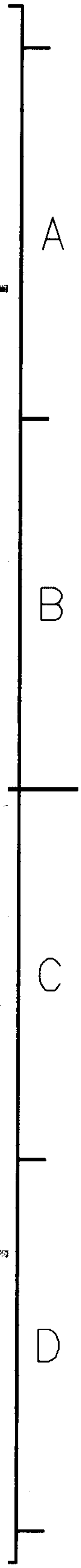
1
2
3

CL96532156_053.ep
1402



1000	B1
1001	B3
1305	A2
1308	A2
1407	A1
1409	A2
2001	A3
2002	A3
2004	B3
2005	B3
2006	B3
2007	B3
2009	B3
2010	B3
2011	B3
2012	B3
2013	A3
2016	A3
2019	A3
2020	B3
2023	B3
2025	A3
2026	B3
2027	B3
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2032	A3
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2036	A3
2037	A3
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2315	B2
2317	B2
2318	B2
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2341	B2
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2352	B1
2356	B2
2357	B2
2358	A2
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2367	A1
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2639	D2
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2708	C2
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3418	A2
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6001	B3
6003	B3
6403	A2
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6653	D2
6654	D2
7001	B3
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7008	B3
7009	B3
7010	B3
7323	A2
7340	B2
7403	A2
7658	D2
7663	D1
7674	D2
7675	C2
7680	C2
7681	C2
7704	C3
7709	C3
7714	D3
7715	D3

CL96532156_042.eps
180200

SSP (tuner side overview)

1 2 3

A

Part 1

B

CL96532156_059.pdf
140200

Part

CL96532156_060
140

C

Part 3

D

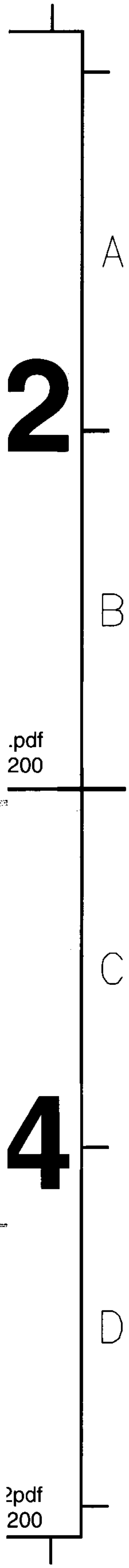
CL96532156_061.pdf
140200

Part

CL96532156_06
140

1 2 3

CL96532156



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140200

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0680	D2
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0682	D2
1301	B2
1408	A2
1651	D2
1701	C1
2003	B1
2008	B1
2014	A2
2015	A1
2017	A1
2022	A2
2024	B1
2031	A1
2038	A1
2303	B2
2304	B2
2305	B3
2306	B3
2307	B2
2308	B2
2309	B2
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2324	B2
2325	B2
2328	B2
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2717	C1
2718	C2
2719	C1
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2721	C1
2723	C1
2724	C1
2725	C2
2726	C1
2728	D1
2730	C1
2731	C1
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2795	D2
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2917	C3
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3006	B1
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3060	B2
3061	A1
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3796	C1
3798	C1
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4306	B2
4310	B3
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4725	D1
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6307	A2
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6319	B2
6320	B3
6321	B2
6334	B2
6651	C2
7002	A2
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7005	A1
7006	A1
7011	B1
7301	B2
7303	B2
7306	B3
7308	B2
7309	B2
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7311	A2
7312	B2
7320	B3
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7330	A2
7407	A3
7411	A3
7651	D2
7652	D3
7656	D3
7661	D3
7701	C1
7702	C1
7708	D1
7713	C1
7716	C1

CL96532156_048.eps
180200

CRT panel

0031 E5
0224 E1
0235 A6
0298-A E8
0298-B E8
0298-C C6
0298-D C6
0298-E C6
0298-F D6
0298-G D6
0298-H E6
0298-I E9
0298-K E9
0334 F10
0340 B1
0383 B6
2300 A4
2301 A1
2302 A2
2303 A4
2304 A4
2305 B2
2306 B2
2307 B4
2308 C2
2309 C4
2310 C2
2312 D2
2313 E2
2315 B1
2316 E2
2317 F9
2318 E7
2320 E3
2321 D2
2322 E2
2323 E2
2324 F9
2325 A3
3300 A1
3301 A4
3302 A2
3303 A3
3304 A5
3305 A2
3306 A3
3307 B2
3308 B5
3309 B4
3310 B6
3311 B2
3312 B3
3313 B3
3314 B3
3315 B2
3316 C5
3317 C2
3318 C4
3319 C5
3320 C2
3322 B1
3334 E7
3335 D2
3336 E2
3337 D2
3338 E5
3339 D5
3340 D5
3341 E2
3342 D2
3343 E1
3345 E6
3347 F9
3348 E1
3349 E8
3350 D4
3351 D4
3352 E4
3354 E4
3355 A5
3356 B6
3357 C5
5300 B5
6305 D5
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7301 A3
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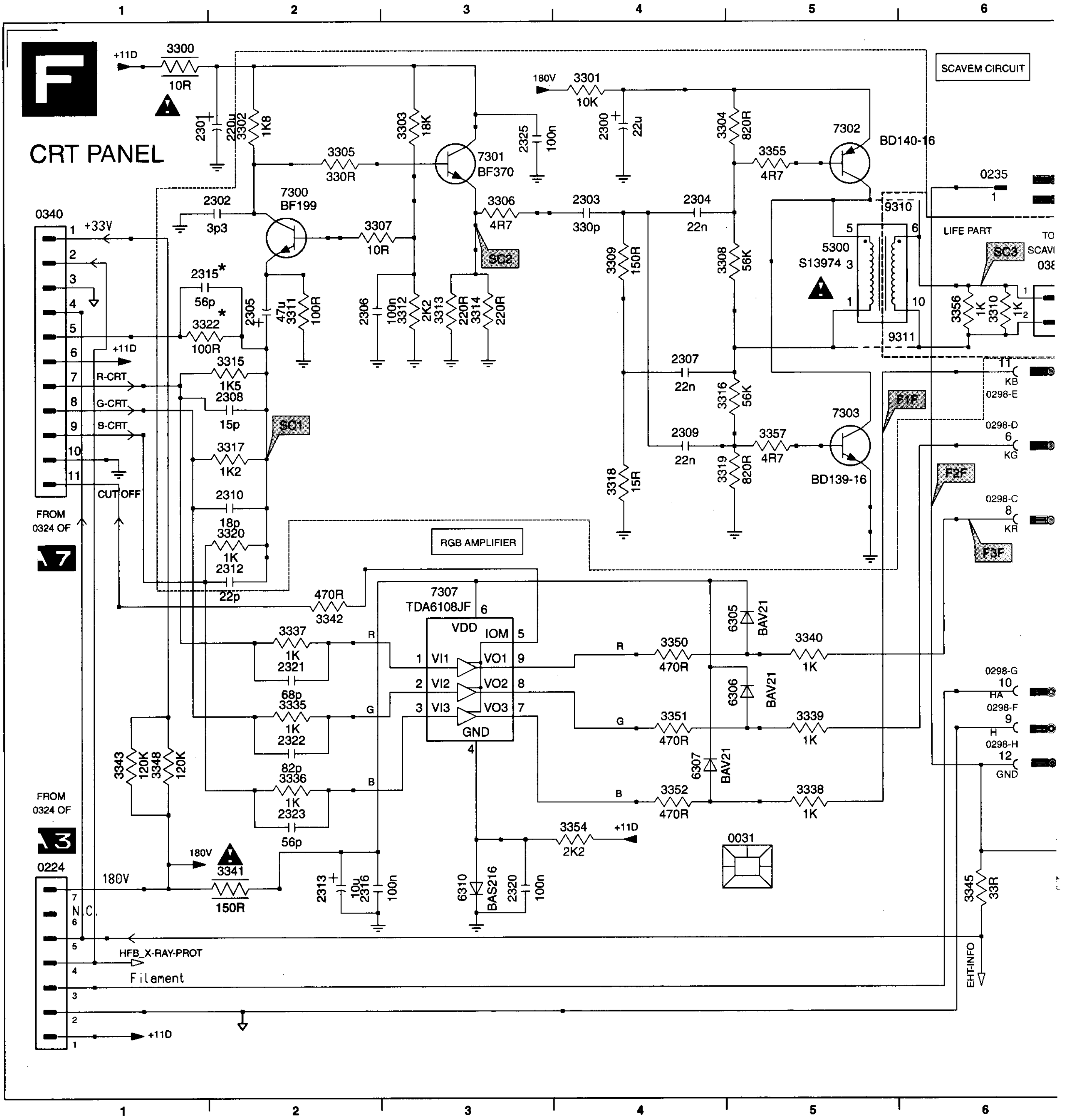
9311 B6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2
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5
6
F
CRT PANEL
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10R
2301
220u
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3303
18K
7301
BF370
2325
100n
180V
3301
10K
2300
22u
3304
820R
7302
BD140-16
3355
4R7
SCAVEM CIRCUIT
0235
3305
330R
0340
+33V
2302
3p3
7300
BF199
3307
10R
3306
4R7
2303
330p
2304
22n
9310
5300
S13974
LIFE PART
TO SCAVI 038
SC3
SC2
3309
150R
3308
56K
2315*
56p
3322
100R
2305
47u
3311
100R
2306
100n
3312
2K2
3313
220R
3314
220R
3356
1K
3310
1K
9311
+11D
R-CRT
G-CRT
B-CRT
3315
1K5
2308
15p
SC1
3317
1K2
2310
18p
3320
1K
2312
22p
CUT OFF
FROM 0324 OF
7
2307
22n
3316
56K
2309
22n
3357
4R7
7303
BD139-16
3318
15R
3319
820R
F1F
F2F
F3F
11 KB 0298-E
0298-D 6 KG
0298-C 8 KR
RGB AMPLIFIER
470R
3342
7307
TDA6108JF
VDD
IOM
VI1
VI2
VI3
VO1
VO2
VO3
GND
3337
1K
2321
68p
3335
1K
2322
82p
3336
1K
2323
56p
R
G
B
6305
BAV21
6306
BAV21
6307
BAV21
3350
470R
3351
470R
3352
470R
3340
1K
3339
1K
3338
1K
0298-G 10 HA
0298-F 9 H
0298-H 12 GND
3343
120K
3348
120K
FROM 0324 OF
3
0224
180V
3341
150R
2313
10u
2316
100n
6310
BAS216
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0031
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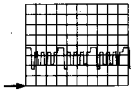
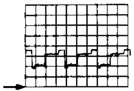
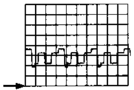
33R
EHT-INFO
N.C.
HFB_X-RAY-PROT
Filament


F1F Blue

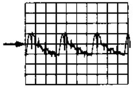
50V / div DC
10ms / div


F2F Green

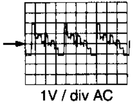
50V / div DC
10ms / div


F3F Red

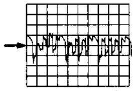
50V / div DC
10ms / div


SC1 7300_E

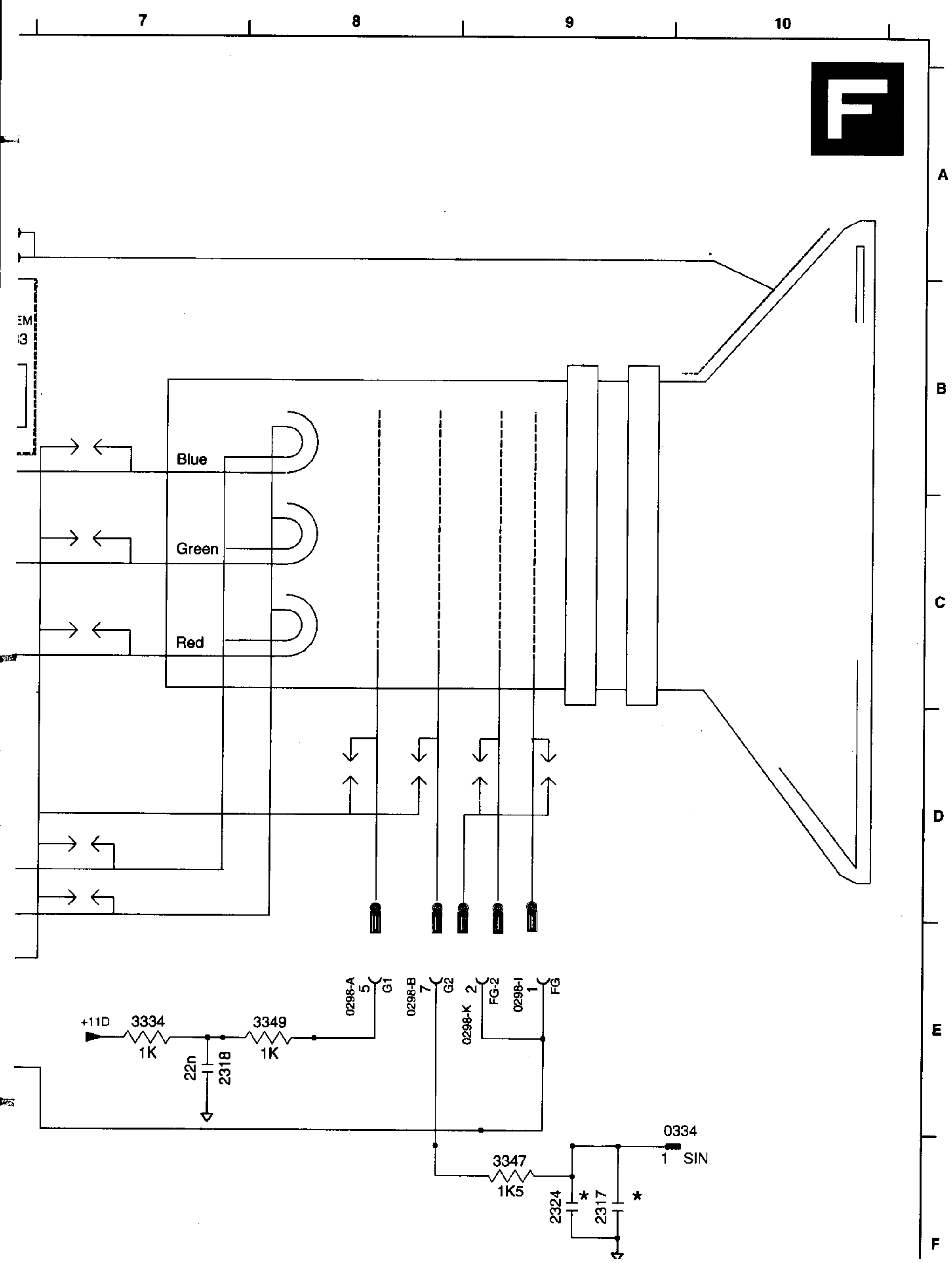
20mV / div AC
10ms / div


SC2 7301_E

1V / div AC
10ms / div

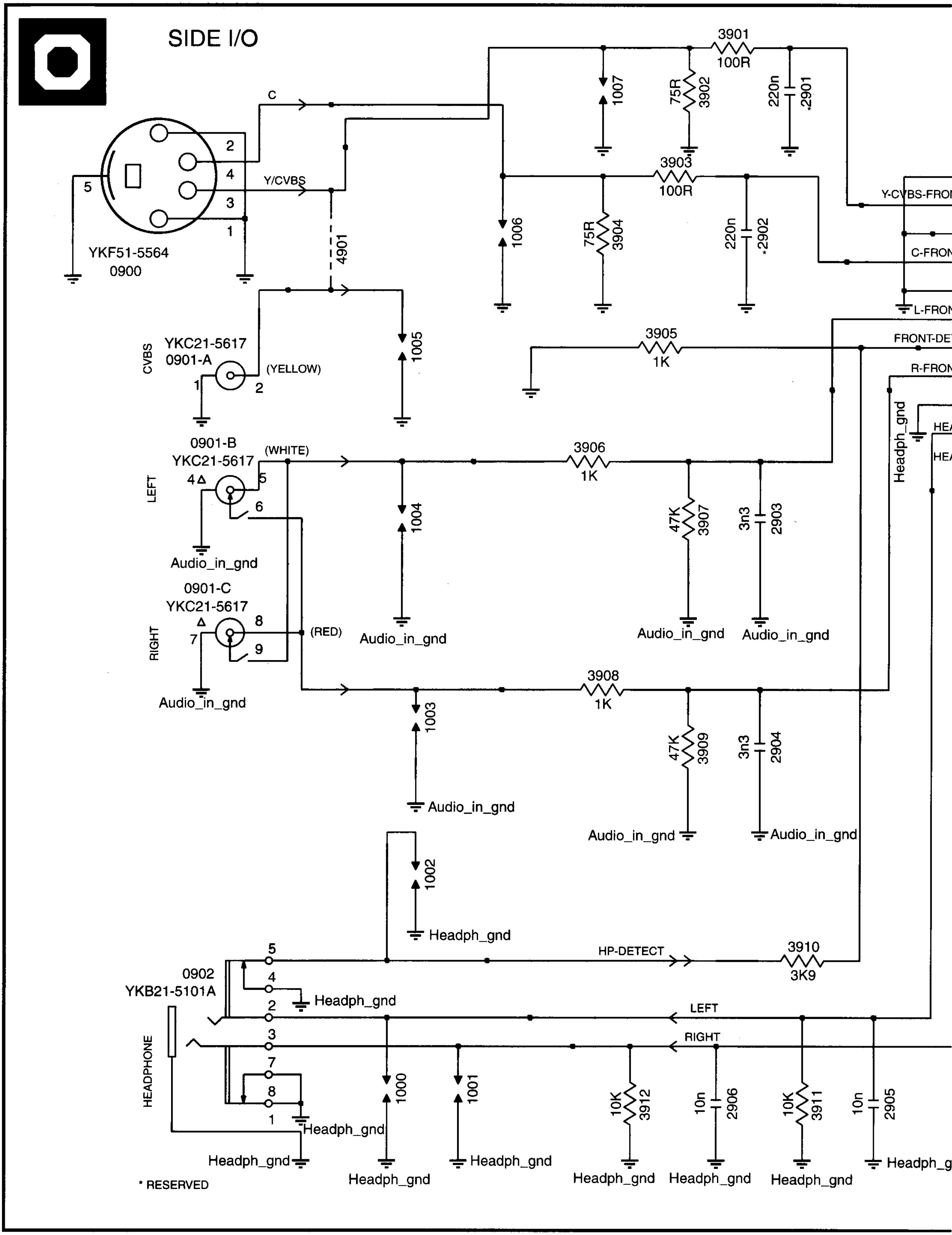

SC3 Coil

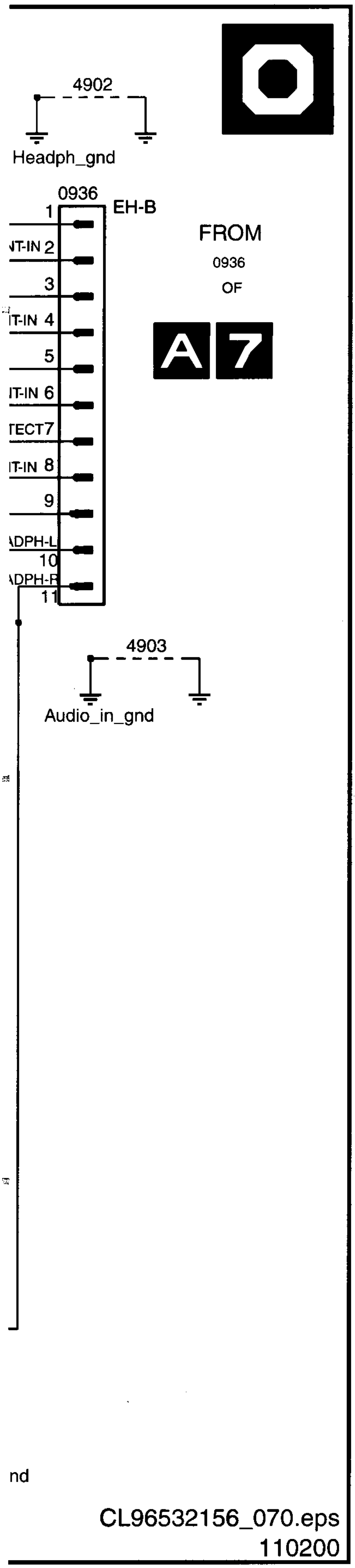
0,5V / div AC
10ms / div



Diversity CRT-Panel					
PosNr	*29"*	*25"*	*28"*	*28" WS*	*32" WS*
0298	-	-	-	-	SOC 9P
0298	CON 8P	CON 8P	CON 8P	CON 8P	-
0383	CON 02P	-	-	CON 02P	CON 02P
2300	22U	-	-	22U	22U
2301	220U	-	-	220U	220U
2302	3P3	-	-	3P3	3P3
2303	470P	-	-	470P	470P
2304	22N	-	-	22N	22N
2305	47U	-	-	47U	47U
2306	100N	-	-	100N	100N
2307	22N	-	-	22N	22N
2308	15P	-	-	15P	15P
2309	22N	-	-	22N	22N
2310	18P	-	-	18P	18P
2312	22P	-	-	22P	22P
2317	4N7	4N7	4N7	4N7	-
2317	4N7	4N7	4N7	4N7	-
2321	-	68P	68P	-	-
2322	-	82P	82P	-	-
2323	-	56P	56P	-	-
2324	-	-	-	-	820P
2325	100N	-	-	100N	100N
3300	FUSE 10R	-	-	FUSE 10R	FUSE 10R
3301	3W 10K	-	-	3W 10K	3W 10K
3302	1K8	-	-	1K8	1K8
3303	18K	-	-	18K	18K
3304	820R	-	-	820R	820R
3305	330R	-	-	330R	330R
3306	4R7	-	-	4R7	4R7
3307	10R	-	-	10R	10R
3308	56K	-	-	56K	56K
3309	150R	-	-	150R	150R
3310	1K	-	-	1K	1K
3311	100R	-	-	100R	100R
3312	2K2	-	-	2K2	2K2
3313	220R	-	-	220R	220R
3314	220R	-	-	220R	220R
3315	1K5	-	-	1K5	1K5
3316	56K	-	-	56K	56K
3317	1K2	-	-	1K2	1K2
3318	15R	-	-	15R	15R
3319	820R	-	-	820R	820R
3320	1K	-	-	1K	1K
3335	100R	-	-	100R	100R
3335	-	1K	1K	-	-
3336	100R	-	-	100R	100R
3336	-	1K	1K	-	-
3337	100R	-	-	100R	100R
3337	-	1K	1K	-	-
3355	4R7	-	-	4R7	4R7
3356	1K	-	-	1K	1K
3357	4R7	-	-	4R7	4R7
5300	TFM	-	-	TFM	TFM
7300	SIGF199	-	-	SIGF199	SIGF199
7301	SIGF370	-	-	SIGF370	SIGF370
7302	TRA POW	-	-	TRA POW	TRA POW
7303	TRA POW	-	-	TRA POW	TRA POW
9305	WR	-	-	WR	WR
9308	WR	-	-	WR	WR
9309	WR	-	-	WR	WR
9312	WR	-	-	WR	WR
9313	WR	-	-	WR	WR
9424	-	-	-	-	WR

Side I/O


SIDE I/O
C
Y/CVBS
5
2
4
3
1
YKF51-5564
0900
4901
3901
100R
1007
75R
3902
220n
2901
*
3903
100R
1006
75R
3904
220n
*2902
Y-CVBS-FRO
C-FRON
L-FRON
FRONT-DE
R-FRON
Headph_gnd
HE
HE
3905
1K
1005
CVBS
YKC21-5617
0901-A
1
2
(YELLOW)
0901-B
YKC21-5617
4Δ
5
6
(WHITE)
LEFT
Audio_in_gnd
1004
3906
1K
47K
3907
3n3
2903
Audio_in_gnd
Audio_in_gnd
Audio_in_gnd
0901-C
YKC21-5617
Δ
7
8
9
(RED)
RIGHT
Audio_in_gnd
3908
1K
1003
Audio_in_gnd
47K
3909
3n3
2904
Audio_in_gnd
Audio_in_gnd
1002
Headph_gnd
0902
YKB21-5101A
5
4
2
3
7
8
1
HEADPHONE
Headph_gnd
HP-DETECT
3910
3K9
LEFT
RIGHT
1000
1001
10K
3912
10n
2906
10K
3911
10n
2905
Headph_gnd
Headph_gnd
Headph_gnd
Headph_gnd
Headph_gnd
Headph_gnd
Headph_gnd
Headph_g
* RESERVED


4902
Headph_gnd
0936
EH-B
1
NT-IN 2
3
IT-IN 4
5
IT-IN 6
TECT7
IT-IN 8
9
DPH-L
10
DPH-R
11
FROM
0936
OF
A7
4903
Audio_in_gnd
nd
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8. Electrical alignments

8.1 General alignment conditions

All electrical alignments should be made under the following conditions:

- Power supply voltage: 230 V ± 10 %; 50 - 60 Hz ± 5 %. Should be applied via an isolating transformer with low internal resistance.
- Warm-up time ≈ 20 minutes.
- Voltages and oscillograms are measured in relation to Tuner earth (with exception to the voltages on the primary side of the power supply). Never use the cooling fins/plates as ground: they are 'hot' ! ! !
- Test probe: Ri > 10 MΩ, Ci < 20 pF.
- Use an isolated trimmer/screwdriver for the alignments

8.2 Alignments on the large signal panel (LSP)

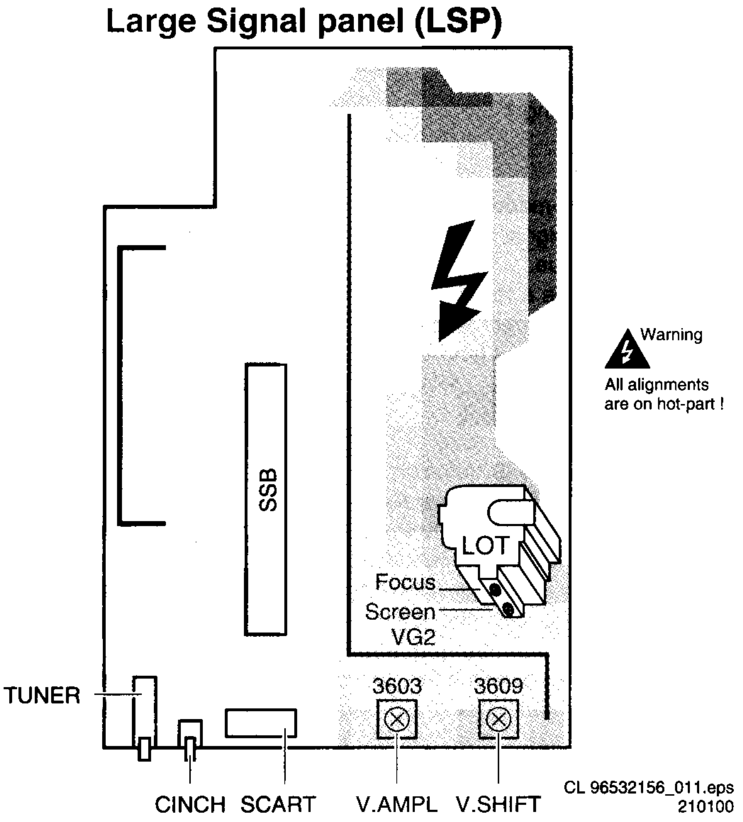

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Figure 8-1

8.2.1 Focusing

1. Tune the set to a crosshatch test pattern (use an external video pattern generator).
2. Adjust the Focus potentiometer (upper potmeter, see figure 8-1) for an overall optimum focusing of the picture.

8.2.2 Vg2 adjustment

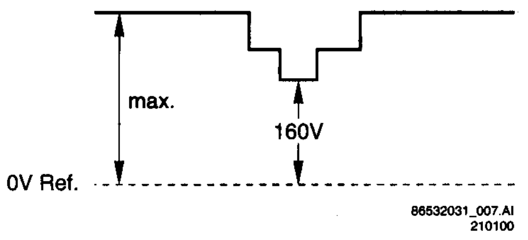

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Figure 8-2

Elucidation: In the frame blanking period of the R, G and B signals applied to the CRT, a measuring pulse with different DC levels is inserted by the 'HOP' video processor. Measure the black level pulse during the vertical flyback at the RGB cathodes of the CRT.

1. Put the set in the SDM mode (see chapter 5.2.1).
2. Insert a black test-pattern signal (carrier 475.25 MHz) to the Tuner input.
3. Connect an oscilloscope (position 50 V/Div DC and 2 ms/Div) alternately to the CRT cathodes (Red pin 8, Green pin 6, Blue pin 11) and measure for each cathode the DC level of the measuring pulse (see elucidation above and figure 8-2) and write down each value. Remark: Trigger the scope external via a CVBS signal (for instance via pin 19 of the SCART1 connection).
4. Adjust the Vg2 potentiometer (lower potmeter, see figure 8-1) so that the measuring pulse with the highest noted level is on 160 ± 3 V_{DC} level.

8.3 Vertical amplitude alignment

1. Tune the set to a crosshatch test pattern (use an external video pattern generator).
2. Align the vertical amplitude with R3603 (see Fig. 8-1) so that the complete test pattern is visible.

8.4 Vertical shift alignment

1. Tune the set to a crosshatch test pattern (use an external video pattern generator).
2. Align the vertical centering with R3609 (see Fig. 8-1) so that the test pattern is located vertically in the middle.
3. Repeat the 'vertical amplitude' alignment if necessary.

8.5 Alignments and settings in the Service Alignment Menu

8.5.1 General

Put the set in the SAM mode (see chapter 5.2.2). The Service Alignment Mode menu will now appear on the screen. Via 'Alignments' the following submenu's can be selected:

- General:
  - Drive
  - Luminance Delays
  - EHT Compensation
  - Soft clipper
  - Luma gain
  - IF AFC
  - Tuner AGC
  - Blend intensity
  - Adjust Peak White Limiter
  - Vg2 Test Pattern
- Normal Geometry: General geometry alignments.
- Super Wide Geometry: Geometry alignments for the 'Panorama' position in 16:9 sets (only valid for wide screen sets; alignments can be performed, however, it is better to set values as mentioned below).
- Options: Setting the initialisation codes in the set via text.
- Option Numbers: All options together, expressed in two long numbers. The original factory setting for these numbers can be found on the picture tube sticker on the inside of the set.
- Store: Store all alignments.

The alignments are explained now in the sequence of the sub-menu:

8.5.2 'General' alignments in Service Alignment Menu:

- Once all alignments/settings have been completed the item 'Store' must be selected to record all the values in the permanent memory of the set.
- If the Option codes have been changed and stored, the set has to be switched 'OFF' and 'ON' using the mains switch to activate the new settings (when switching via Standby, the option code settings are NOT read by the microprocessor).
- If an empty EAROM (permanent memory) is detected, all settings are set to pre-programmed default values.
- A built-in test pattern can be called up in various sub-menus. The test pattern generator can be switched on using the item 'Test pattern on/off'. The test pattern only appears AFTER the specific alignment has been selected. The test patterns are generated by the Teletext-IC (OTC).

'Drive'

- Method 1 (with colour analyser):
  1. If you want to align tint-settings with a colour-analyser, the Test pattern must be switched on. You get a white block in middle of the image now.
  2. Before doing the Tint-settings the 'Cathode'-parameter must be aligned. This is dependent of the picture tube size and brand. See table "Cathode parameter" for the colour-analyser readings.
  3. Tint-settings: Set the white levels for the 3 Tint-settings 'Normal', 'Warm' and 'Cool'. The next values must be aligned (see table "White levels").

Cathode parameter	
CRT	Light output (cd/m^2)
25" FS	50,0
28" FS	35,0
29" SF	40,0
28" WS	45,0
32" WS	40,0

White levels			
	Cool	Normal	Warm
X	280	289	303
Y	287	299	314
Temp. (K)	10200	8700	7200

- Method 2 (without colour analyser):
  1. Without having a colour-analyser one can set some parameters. This is the next best solution. The setting-parameters are average values coming from production (statistics).
  2. Before doing the Tint-settings the 'Cathode'-parameter must be set. For all picture tubes the value '5' must be entered.
  3. The 'Tint' setting must be on 'normal'.
  4. Tint-settings: Set the Red, Green and Blue parameters for the 3 Tint-settings 'Normal', 'Warm' and 'Cool'. See table 8.4 for the values.
  5. Red BL offset: herewith the Black Level can be aligned very precise. Pre-set value is 7.
  6. Green BL offset: herewith the Black Level can be aligned very precise. Pre-set value is 7.

Tint settings			
	Cool	Normal	Warm
R	24	25	27
G	20	20	20
B	18	14	10

'Luminance delays'

With the 'Luminance delays' alignment the luminance information is placed on the chrominance information (brightness is pushed onto the colour). Use a colour bar/grey scale pattern as test signal.

- Lum. Delay Pal: Apply a PAL colour bar/grey scale pattern as a test signal. Adjust 'Lum. Delay Pal' until the transients of the colour part and black and white part of the test pattern are at the same position.
- Lum. Delay Secam: Apply a SECAM colour bar/grey scale pattern as a test signal. Adjust 'Lum. Delay Pal' until the transients of the colour part and black and white part of the test pattern are at the same position.
- Lum. Delay Bypass: apply a NTSC colour bar/greyscale pattern as a test signal. Adjust value until the transients of the colour and black & white part of the test area are at the same position.

'EHT compensation'

Fixed setting: 0

'Soft clipper"

Fixed setting:Pwl + 0%

'Luma gain'

Fixed setting:1

'IF AFC'

The SAM-mode is needed to make alignment, a test generator to make signal and the Installation-menu to check the 'Fine Tune' value.

Supply, via a video generator (e.g. PM5518), a TV-signal with a signal-strength of at least 1 mV and a frequency of 475.25 MHz. Use BG if possible, otherwise match the system of your generator with the received signal in the set.

Alignment procedure:

1. Go to the 'Installation' menu.
2. Select 'Manual installation'.
3. Tune the TV-set to the system and frequency described above via 'Search' - '475' - 'OK'.
4. If the frequency showed in the line 'Fine tune' is between 475.18 MHz and 475.31 MHz, you don't need to re-adjust the IF-AFC.
5. If not, adjust the frequency in the 'Fine tune' line to 475.25 MHz and 'Store' the program (this is very important because this will disable the AFC algorythm).
6. Now go to the SAM and select 'Alignments' - 'General' - 'IF AFC'.
7. During the 'IF AFC'-parameter adjustment, one can see OSD feedback in the top of the screen. The OSD feedback can give 4 kind of messages:

AFC-window	AFC-frequency versus reference
Out	High
In	High
In	Low
Out	Low

The first item (In or Out) informs you whether you are in or out the AFC-window.

The second item (High or Low) informs you about whether the AFC-frequency is too high or too low.

1. First you must align the 'IF AFC'-parameter such that you come into the AFC-window (= 'In')
2. Then you must look for the point where the 'IF AFC'-parameter changes from High to Low. This level is the value you are looking for.
3. After adjustment 'Store' the value.
4. Now return to the 'Installation' menu.
5. Select 'Manual Installation' - 'Search' - '475' - 'OK' and 'Store'. This will set the AFC 'on' again.

Service-tip: If you do not trust the accuracy of the frequency of your Service-generator, first 'measure' with 'Fine tune'-line (manual install-menu) of a good set your video generator.

'Tuner AGC'
The SAM-mode is needed to make alignment, a test generator to make signal, a DC-Voltmeter to measure at pin 1 of Tuner.

Supply a TV-signal, with a frequency of 475.25 MHz and a signal-strength of about 2 mV. Measure the DC-voltage on pin 1 of the Tuner (position 1200). With the 'Tuner AGC'-alignment in the SAM-menu, this voltage can be aligned. Alignment is correct when DC-voltage is just below 3.5 V.

'Blend intensity'
(This alignment could be used when micro controller or HOP-IC has been replaced).
It aligns the level of transparency of the menu-picture blended into the main-picture.

1. Position the brightness-, contrast- and colour setting in the middle position (picture-menu).
2. Apply a signal with a 100 % white video-pattern.
3. Connect an oscilloscope to pin 7 of connector 0340 of the CRT panel and measure the Red output level.
4. Align 'blending intensity'-parameter such that the blended signal is 65 % of the black-white amplitude. Practically this will be about 1.3 V (blended signal) versus 2 V (full white signal).
5. The parameter can be adjusted in between 0 and 31.

'Adjust Peak White Limiter'
Depending on the picture-tube size, the next value of the table must be entered:

Peak White Limiter	
25" FS	4
28" FS	4
29" SF	4
24" WS	4
28" WS	4
32" WS	4

'Vg2 Test Pattern'
Here the Vg2 Test pattern can be switched on.

8.5.3 'Normal Geometry' alignments in the Service Alignment Menu

Warning: At this moment, the 'INTERNAL TEST PATTERN' of the set software will lead to a mis-alignment of the picture geometry. Therefor use an external generator with a geometry pattern (e.g. crosshatch) to align the set (only for the 'Vertical slope' adjustment the internal test pattern can be used).

'Vertical slope'
Select 'Test Pattern on' (read warning above).

1. Set the start conditions for 16:9 sets: ~~'V. S-correction' value on 8 for the 28" and on 7 for the 32" set.~~ The boundary-stripes of the test pattern should be positioned on the edge of the picture tube.
2. Align 'V. slope' (when aligning the below half of the picture is blanked). The middle line of the test pattern must be matched with the edge of this blanking/picture transient in the middle of the picture. Pushing 'MENU' button again, gives you previous menu again. (This alignment is meant to align the zero crossing of the frame-deflection to the mechanical middle of the picture tube.)

'Horizontal amplitude and centring'
Use an external pattern generator with a geometry pattern (e.g. crosshatch).

1. Using 'H. amplitude' align the horizontal amplitude so that the entire test pattern is visible.
2. Use an external test signal, with a centre-reference from a service-generator. Use 'H shift' to align the picture horizontally in the middle.
3. Repeat the 'H amplitude' alignment if necessary.

'East/west alignment'
Use an external pattern generator with a geometry pattern (e.g. crosshatch).

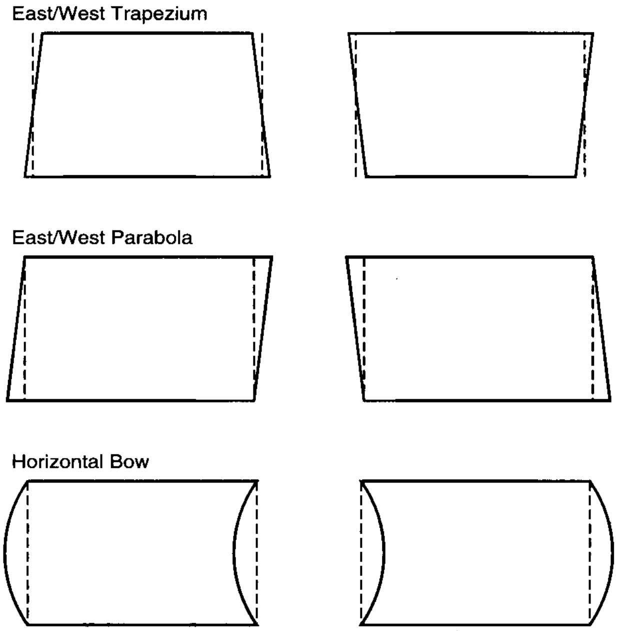

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Figure 8-3

1. Use 'East/West Parabola' to align the vertical lines until straight.
2. 'Upper East/West corner' to align the vertical lines in the upper corners until straight.
3. 'Lower East/West corner' to align the vertical lines in the lower corners until straight.
4. Use 'East/West Trapezium' to align for a rectangular.
5. Use 'Horizontal Parallelogram' to align for straight vertical lines if necessary.
6. Horizontal Bow' (neutral value 31. With this alignment the E/W parabola can be corrected such that it becomes symmetrical).

Repeat steps 1 to 6 if necessary.

8.5.4 'Super wide geometry' alignments (for widescreen sets) in the Service Alignment Menu

The header of this paragraph and also the menu's are somewhat misleading. We only need to set the following values (if the normal geometry alignment has been performed correctly):

1. ~~V. S-Correction: enter value of 'normal geometry' alignment.~~
2. H. amplitude: enter value of 'normal geometry' alignment subtracted by 4.
3. East/west Parabola: enter value of 'normal geometry' alignment.

8.6 Option menu

8.6.1 Introduction:

The microprocessor communicates with a large number of I^2C-IC's in the set. To ensure good communication and make digital diagnosis possible, the microprocessor has to know which IC's have to be addressed. The presence of specific IC's or functions is made known by means of the option codes.

All options codes can be manipulated using both the option numbers and/or the Option menu.

All hardware related options are incorporated under the heading 'Options' of the 'Alignments' sub-menu of the 'Service Alignment Mode'. All software related options that are incorporated under the heading 'Dealer Options' of the 'Service Alignment Mode", can also be reached directly via the 'DEALER' button of the DST.

8.6.2 Options in the Service Alignment Mode

Menu-item	Subjects	Options	Physically in the set
Dual screen/PIP	Aux type	Yes	Dual Screen / PIP module present
		No	Dual Screen / PIP module not present
Teletext/EPG	TXT	Yes	Teletext present
		No	Teletext not present
	NextView present	Yes	NextView set
		No	NextView not set
	NextView type	Flashram	Flash-RAM present
		No Flashram	Flash-RAM present
Communication	Easylink Plus	Yes	Easylink Plus set
		No	Easylink Plus not set
Picture Tube	CRT Type	4:3	4:3 picture tube
		16:9	16:9 picture tube
	Picture Rotation	Yes	Frame rotation circuitry present (diagram **A4**)
		No	Frame rotation circuitry not present
	Dynamic focus	Yes	Dynamic focus picture tube present
		No	Dynamic focus picture tube not present
	Dooming prevent	Off	
		4:3	
		SF 16:9	
		RF 16:9	
Video repro	Featurebox type	Eco	PROZONIC not present
		Prozonic	PROZONIC present
	Field memories	2	
		3	
	Lightsensor	Yes	Lightsensor present
		No	Lightsensor not present
	PALplus	Yes	PALplus module present
		No	PALplus module not present
	Combfilter	Yes	Not valid for Europe
		No	
	Picture improvement	Yes	
		No	
	Picnic	Yes	PICNIC present
		No	PICNIC not present
	Picnic AGC	Yes	In normal operation: Yes
		No	During 'Drive' alignments: No
	Signalling bits	Yes	
		No	
Source Selection	External 3	Yes	3rd EURO connector present
		No	No 3rd EURO connector present
	External 4	Yes	4th EURO connector present
		No	No 4th EURO connector present
Audio Repro	Dolby	None	
		Pro Logic	
	Rear speakers	Corded	Passive surroundbox present
		Virtual	
		Cordless	Active surroundbox present
	Acoustic system	FL7	Applicable for sets with subwoofer
		FL8	Applicable for sets without subwoofer
		FL9 Monitor	Monitor look (only tweeters at both sides)
		FL9 DAS	FL9 with full range speakers at both sides
	MSP type	MSP3411	
		MSP3415	
		MSP3451	
	AVL enable	On	
		Off	
Miscellaneous	Heatsink Present	Yes	Heatsink present on CRT/SCAVEM panel (diagram F)
		No	Heatsink not present on CRT/SCAVEM panel (diagram **F**)
	Tuner type	UV1316	
		TEDE9	

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8.6.3 Dealer Options in the Service Alignment Mode

- After the option(s) have been changed, they must be stored via the 'STORE' command.
- The new option is only active after the TV is switched off and then back on again using the mains switch (the EAROM is then read out again).

8.6.4 Option number

In case the EAROM has to be replaced, all the options will also require resetting. To be certain that the factory settings are reproduced exactly, both option numbers have to be set. These numbers can be found on a sticker on the picture tube.

Example: Option number 28PT7306/12 could be:
04929 04418 04417 00016
08199 00001 00000 00000

The first line indicates the hardware options 1 to 4, second line is reserved for the software options.
Every 5-digit number represents 16 bits (so maximum number can be 65536 if all options are set).

Bit	HW1	HW2	HW3	HW4	SW1	SW2	SW3	SW4
0 (1)	FBX (1)		EXT3	MSP (8)	Auto TV	CTI		
1 (2)	FBX (1)	Dolby PL	EXT4	MSP (8)	Auto Store mode (10)			
2 (4)	FBX (1)	Virtual rear spkrs		China IF	Auto Store mode (10)			
3 (8)	Combfilter	Cordless rear spkrs		Tuner (9)				
4 (16)	PAL-Plus	Dolby Digital	Dual Screen (6)	TXT	Picture mute			SLDP (13)
5 (32)	Field mem. (2)		Dual Screen (6)	China TXT	Demo			SLDP (13)
6 (64)	Light sensor	Cabinet (4)	TXT-EPG-DS		Virgin			AVL
7 (128)	LTP	Cabinet (4)	Aux-headphone					
8 (256)	PICNIC	P50	Aspect Ratio (7)					
9 (512)	PICNIC-AGC		Tilt					
10 (1024)			DAF					
11 (2048)	LNA (3)							
12 (4096)	WSS	EPG	Heatsink		TXT pref. (11)			
13 (8192)	Time constant	EPG type (5)	Home Cinema		TXT region (12)			
14 (16384)								
15 (32768)								

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All bits can be set 'On' (= 1) when the option is available or 'Off' (= 0) when it is not, except for:
(1) 0 = Eco, 1 = PROZONIC, 4 = Eco-DNR.
(2) 0 = 2 Field memories, 32 = 3 Field memories.
(3) 0 = Normal, 8192 = Fast.
(4) 0 = FL7, 64 = FL8, 128 = FL9.
(5) 0 = Type 2, 8192 = Type 2C3.
(6) 0 = None, 16 = PIP, 32 = Dual Screen.
(7) 0 = 4:3, 256 = 16:9.
(8) 0 = MSP3415, 1 = MSP3451, 2 = MSP3411.
(9) 0 = Philips, 8 = Alps.
(10) 0 = None, 2 = PDC/VPS, 4 = TXT-Page, 6 = PDC/VPS/TXT-Page.
(11) 0 = TOP, 4096 = FLOF.
(12) 0 = East, 8192 = West.
(13) 0 = Off, 16 = 4:3, 32 = SF16:9, 48 = RF16:9.
When all the correct options are set, the sum of the decimal value (between brackets in 1st column) of each column will give the option number.

9. Circuit descriptions and abbreviation list

9.1 Circuit descriptions

The following circuits are described:
1. Introduction
2. Block diagrams
3. Power supply
4. Control
5. Tuner & IF
6. Video: High-end Input Processor
7. Video: Feature box
8. Video: High-end Output Processor
9. Synchronisation
10. Horizontal deflection
11. Vertical deflection
12. Audio
13. Teletext / NexTView
14. CRT / SCAVEM / Rotation
15. Software related features

9.1.1 Introduction

The EM2E Europe is a lower specified MG-chassis. EM stands for Eco-MG, 2 for the used processor (1 = Painter, 2 = OTC) and E stands for Europe. This will be, at the moment of launch, the cheapest realised 100 Hz set.

The architecture consist of a conventional large signal panel (LSP) and a small signal board (SSB) module, placed into a so called SIMM-connector (Standard Interface, 80 pins).

The LSP is built up very conventional, with hardly any surface mounted components on the copper side. Difference with the MG-chassis is that the EM2E LSP has a very large 'hot' part, including the deflection coil.

The SSB is a high tech module (2 sides reflow technology, full SMC) with very high component density and complete shielding for EMC-reasons. Despite this, it is designed in such a way, that repair on component level will be possible. To achieve this, attention has been paid to:
- The position of service test lands (Tuner side).
- Accessibility (Tuner side).
- Clearance around surface mounted IC's (for replacing).
- Diagnostics & Fault Finding via ComPair.

Due to the low amount of cabling etc., expectation is that the FCR will be low.

Attention: During the first 4 to 6 months of production, the EM2E set-software will be integrated into a flash-RAM on the SSB. After that period, a mask-ROM will be used. Which IC is used is not of interest for service, but for both solutions it means that Service Workshops must be equipped with dedicated (de)solder equipment for exchanging these IC's.
In case flash-RAM or mask-ROM has to be replaced in the field, dealer will receive always an up-to-date flash-RAM.

Warning: Be aware that half of the LSP-circuitry is 'hot', including the deflection coil.

Protection: The start-up behaviour of the EM2E is different then that of the MG-chassis, meaning that there does not exist a situation as in the MG where we have 'supply ON / deflection circuit OFF'.
This means that isolating failures in the EM2E must be done in a different way. See Chapter 5 of this manual.

9.1.2 Block diagrams

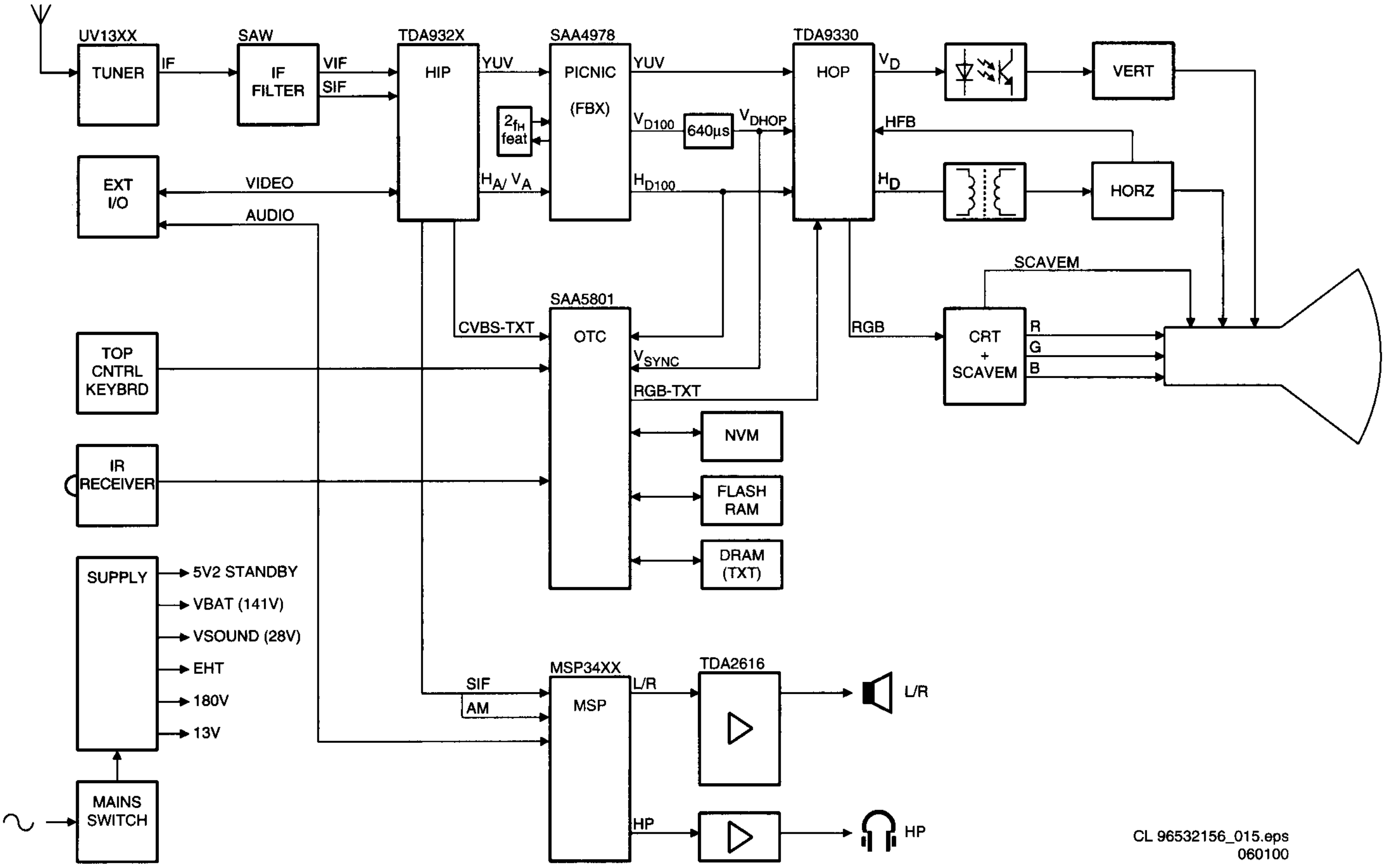
UV13XX
TUNER
IF
SAW
IF FILTER
VIF
SIF
TDA932X
HIP
YUV
SAA4978
PICNIC
(FBX)
2fH feat
HA/ VA
YUV
VD100
640µs
VDHOP
HD100
TDA9330
HOP
VD
HFB
HD
VERT
HORZ
SCAVEM
EXT I/O
VIDEO
AUDIO
SAA5801
CVBS-TXT
OTC
VSYNC
RGB-TXT
RGB
CRT + SCAVEM
R
G
B
TOP CNTRL KEYBRD
IR RECEIVER
NVM
FLASH RAM
DRAM (TXT)
SUPPLY
5V2 STANDBY
VBAT (141V)
VSOUND (28V)
EHT
180V
13V
MAINS SWITCH
MSP34XX
SIF
AM
MSP
L/R
TDA2616
L/R
HP
HP
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Figure 9-1

The tuner type UV1316 is a PLL tuner and delivers the IF-signal, via audio & video SAW-filters, to the HIP (High-end Input Processor). The HIP has the following functions:

- IF modulation.
- Video source- and record select.
- Colour decoder.
- Synchronisation.

Two SCART-connectors can be used: SCART1 is fully equipped and SCART2 is meant for VCR. Pin 10 of SCART2 is used for Easylink and there is a possibility for Y/C in. The CVBS-out on pin 19 can be used for WYSIWYR (What You See Is What You Record).

The HIP delivers the signal to the PICNIC. This IC takes care of:

- Analogue to Digital conversion and vice versa.
- 50 to 100 Hz conversion.
- Panorama mode.
- Noise reduction.
- Dynamic contrast.

For Digital Scan the PROZONIC is required, which can be connected to the PICNIC. This IC is mentioned as 2fH features in the blockdiagram.

After the PICNIC the, now 100 Hz, YUV- and H/V-signals are fed to the HOP (High-end Output Processor). This IC handles the video control and geometry part. The RGB-signals from TXT/OSD are also inserted via the HOP. The video part delivers the RGB signals to the CRT-panel and the geometry part delivers the H-drive, V-drive and also a drive-signal for rotation (as a variable DC-level on the V-drive signal).

Both deflection circuits are 'hot' and located on the LSP and are driven by the HOP. To make the galvanic separation, the line drive is driven via transformer 5410 and the framedrive via optocoupler 7610.The horizontal output stage generates some supply voltages, the EHT-, focus- and Vg2-voltages.

The RGB amplifiers on the CRT-panel are integrated in one IC and are supplied with 180 V from the LOT.
The SCAVEM circuit modulates transitions of the Luminance (Y) signal on the horizontal deflection current, giving a sharper picture.

The sound part is built around the MSP34xx (Multichannel Sound Processor) for IF sound detection, sound control and source selection. Dolby decoding is also done by the MSP. Amplification is done via an integrated power amplifier IC, the TDA2616.

The microprocessor, called OTC (OSD, Teletext and Control), takes care of the analogue TXT input- and output processing. The OTC, ROM and RAM are supplied with 3.3 V, which is derived from the +5VSTANDBY.
The NVM (Non Volatile Memory) is used to store the settings, the FLASH RAM contains the set software and the DRAM is used for storing the Teletext pages.

In EM2E there is a separate Standby Supply in order to reduce the Standby power consumption. During Standby, the Main Supply is switched off (via TS7529). A relay is used to switch the Degaussing circuit.

The Main Supply, a SMPS based on the 'down-converter' principle, generates the 141 V (V_{BAT}) and the 28 V for the audio part.
Difference with former MG-sets is that V_{BAT} is not mains isolated (is 'hot') and is alignment free.

9.1.3 Power supply (diagram A1 & A2)

General
The power supply has a number of main functions. These functions are dealt with in succession:

- Mains filter
- Degaussing picture tube
- Standby power supply
- Main supply

Mains filter (diagram A1)

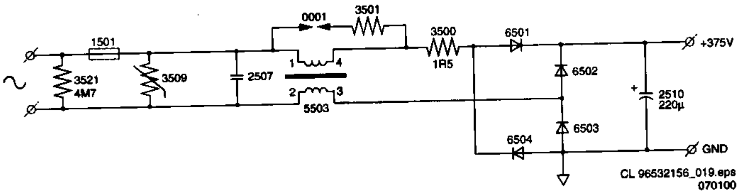

Figure 9-2

The mains filter has 2 functions: it prevents high-frequency signals to be transferred into the mains and it protects the set from lightning damage.

C2507 prevents the high-frequency signals, generated by the set, to be conveyed into the mains by short-circuiting them.

In case of a lightning surge between the 2 phases (differential mode) the energy is immediately bled away through the VDR (R3509) to the other phase.
In case of a lightning surge on both phases of the mains in relation to the aerial earth, the mains filter acts as a high resistance (U_{EMK}=L * dI/dt) as a result of which the voltage across coil L5503/04 increases. A spark gap (0001) prevents that the voltage increases too much, which would lead to a damaged coil. When ignited, the current will be discharged via this spark gap.
The two networks using R3503//0002 and R3502//0003 are also used for lightning protection. They lead the energy of a common-mode lightning surge from the 'cold' to the 'hot' side in case of insertion on the aerial or from the 'hot' to the 'cold' side in case of insertion via the mains-input.
Resistor R3500 is used for limiting the inrush-current.

For 240 V_{AC} mains-voltage applications, jumper 9502 is used. Diodes 6501 to 6504 now work as bridge rectifier charging C2510. For 110 V_{AC} mains-voltage applications, i.s.o. jumper 9502, jumpers 9503 and 9504 are used. Now the diodes will work as a voltage doubler charging C2516 and C2517 (not implemented for Europe).

Degaussing picture tube (diagram A1)
After switching 'ON' the set via the mains-switch, the DEGAUSS_INPUT signal from the processor (OTC) will be made high, transistor 7528 will conduct and relay 1002 will be activated. Initially a considerable current will flow, via PTC 3516, through the degaussing coil. The PTC will heat up, resistance will rise and the current will decay rapidly. The OTC will switch off the relay after 12 seconds.

Standby power supply (diagram A2)
This power supply is of a SOPS type (Self-Oscillating Power Supply) and is regulated by the controlled switching of an oscillator. It uses the so-called 'Flyback' principle:

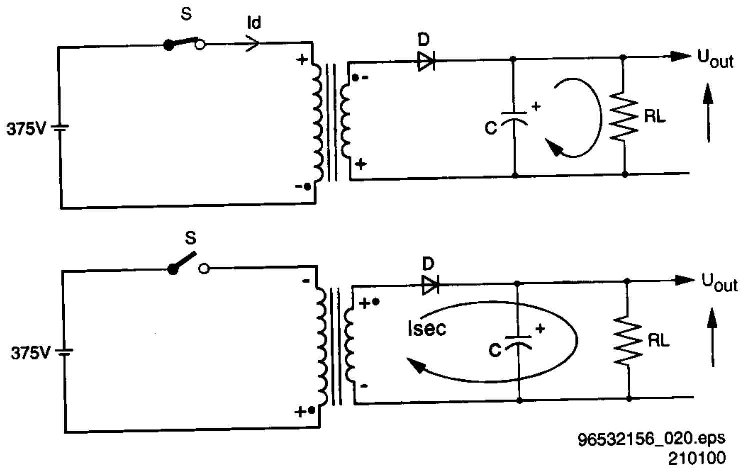

Figure 9-3

- After closing switch 'S', the current I_D will increase linear in time. The magnetic energy in the primary coil is directly proportional with the self-inductance of the coil and current I_D (thus with the time the switch is closed). The voltage polarity at the secondary winding is negative (due to different winding direction), meaning that diode D will block. Capacitor C will discharge via R_L, U_{OUT} will decrease.
- Opening switch 'S' will generate a counter-e.m.f. in the primary winding, trying to maintain current I_D. Through this the polarity of the secondary voltage will inverse. The magnetic energy, stored in the coil, will now be transformed to the secondary side. Diode D will now conduct, capacitor C will be charged and U_{OUT} will increase.

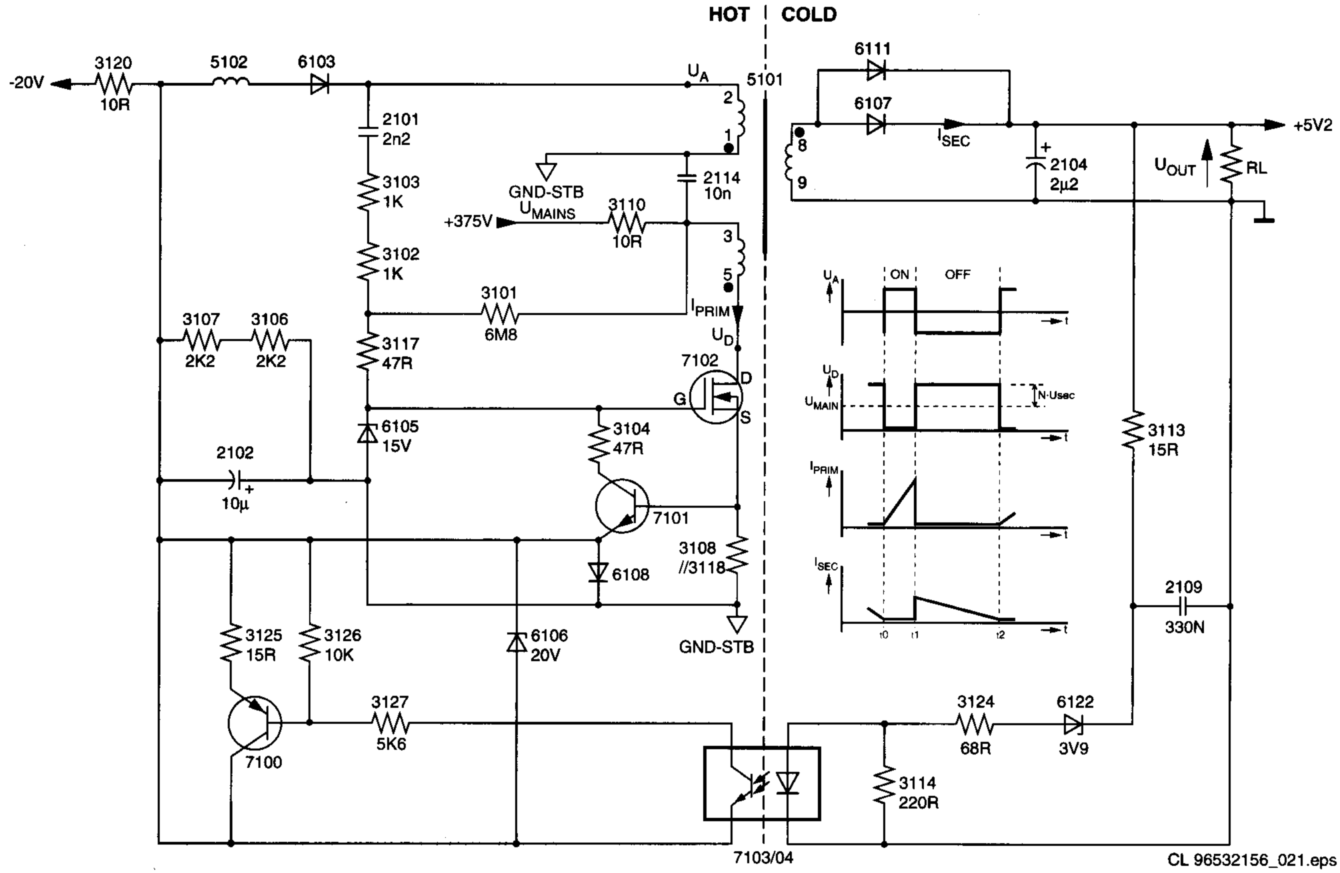

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Figure 9-4

To apply this on the EM2E (diagram A2): replace Switch 'S' by FET TS7102, coil L by L5101, diode D by D6107//D6111 and C by C2104.

Time interval t0 - t1:
After switching on the set, the gate of MOSFET TS7102 will be high (max. 15 V due to zenerdiode D6105). This will drive the FET into saturation (U_{DS} = 0 V). The DC-voltage U_{MAINS} will be transposed across the primary winding of L5101 (3, 5) resulting in a linear increasing current through this coil.
The voltage across the co-coupled coil (1, 2) is also positive and will keep the FET into conductivity via C2101, R3103, R3102 and R3117 for some time. The slope of the primary current is determined by the self-induction of the coil and on the magnitude of the supply voltage (+375 V).
The maximum current is determined by the time the FET stays into conductance (t0 - t1). This time is directly determined by the voltage across R3108//R3118. This voltage is a measure of the current and if it exceeds 1.4 V, TS7101 will be driven into conductivity and consequently connect the gate of TS7102 to earth; the FET will block. The current will be: 1.4 V / (15//4.7 ohm) = 0.39 A.
The voltage across the secondary winding (8,9) will be negative, diodes D6111 and D6107 will block.

Time interval t1 - t2:
The sudden current interruption in the primary coil, will induce a counter-e.m.f. that wants to maintain the current. The voltage on the drain of the FET will increase. The secondary voltage (8, 9) will become positive and will charge C2104 via D6107 and D6111. All energy that was stored in L5101 during t0 - t1 will be transferred into the load. Due to the transformer principle, a voltage will now be induced in the primary winding (3, 5) and the co-coupled winding (1, 2). This voltage will be: N * U_{SEC} (N = winding ratio).
The voltage across the co-coupled coil will be negative, keeping the FET blocked.

Time t2:
At t2, the current through the secondary coil will be reduced to zero, as C2104 is no longer charged. As a consequence, the voltages will decay and will change polarity. The gate of the FET will be again made positive, is driven into conductivity and the cycle starts again.

Feedback, stabilisation:
The Standby Power Supply always oscillates at maximum power, the only limiting factor is the maximum primary current which has been pre-set with R3108//3118.
U_{OUT} is determined by R3114, R3124 and zenerdiode D6122. If the voltage across R3114 exceeds the threshold voltage of the diode of the optocoupler 7104 (±1 V) or, in other words, U_{OUT} exceeds 5.2 V, the transistor of the optocoupler will conduct.
Transistor TS7100 will be driven and a negative voltage will be transposed to the emitter of TS7101. When TS7101 conducts, the gate of the FET is at earth potential forcing the oscillator stop. Due to the load, the secondary voltage U_{OUT} will decrease. At a certain voltage, optocoupler TS7103/04 will block and the oscillator will start again.
Since there are no capacitors and there is a high amplification-factor in the feedback circuit, the feedback is ultra-fast. This is why the ripple on U_{OUT} is minimal. The negative supply voltage (-20 V) used in the feedback circuit originates from the co-coupling coil and is rectified through D6103.
Stabilisation is not effected through duty-cycle control but through burst-mode of TS7100.
Burst-mode is load dependent. If the power supply is less loaded, the secondary voltage will have the tendency to increase more rapidly. If the load on the power supply

increases, then the oscillator stops less often, right up to the moment that the oscillator is operating continuously: maximum load. If the power supply is now loaded even more, the output voltage will decay. The maximum load is determined by the maximum primary current set by R3108//3118.

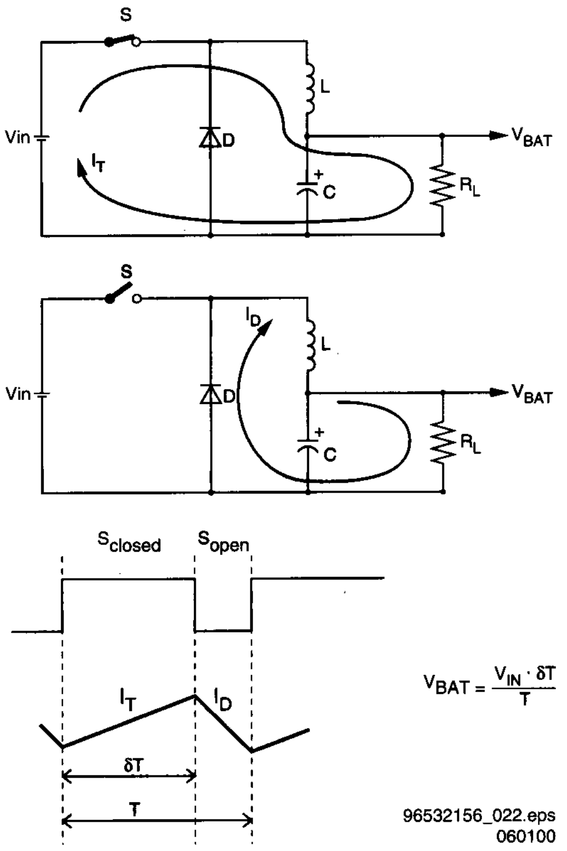
Protection:
If the optocoupler would fail, the secondary voltage will increase. This would have disastrous consequences since many IC's (e.g. OTC, flash-RAM, DRAM) are fed with this 5.2 V. In other words, very expensive repairs would be required. We already know that the negative supply is directly dependent upon the secondary 5.2 V, as a consequence of which the negative supply will increase proportionally as the secondary voltage increases.
If the negative supply in the mean time reaches -30 V, D6106 will start to zener and as a consequence TS7101 will start conducting. Basically, D6106 will take over the stabilisation task of the optocoupler, however, with a considerable spread: from -20 V to -30 V is a 50 % increase, thus U_{OUT} will increase from 5.2 V to max. 7.5 V.

Main supply (diagram A1)

Some important notes on beforehand:

- V_{BAT} is not isolated from the mains supply ('hot').
- V_{BAT} is alignment free.

The Main Power Supply, generates the 141 V (V_{BAT}) and the 28 V for the audio part and is based on the so-called 'down converter' principle.



$$V_{BAT} = \frac{V_{IN} \cdot \delta T}{T}$$

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Figure 9-5

- After closing switch 'S', the linear in time increasing current I_T, , will charge capacitor C.
- Opening switch 'S' will generate a counter-e.m.f. in coil L, trying to maintain current I_T. This is possible via diode D (this diode is also called 'freewheel diode'). So after opening 'S', the magnetic energy stored in coil L will be transferred to electrostatic energy in capacitor C. The V_{IN} will only supply current during the time that 'S' is closed while a constant current is flowing through R_L.
- V_{BAT} is directly proportional with V_{IN} and the time that 'S' is closed and reverse proportional with period time 'T'. So by changing the duty cycle, it will be possible to control V_{BAT}.

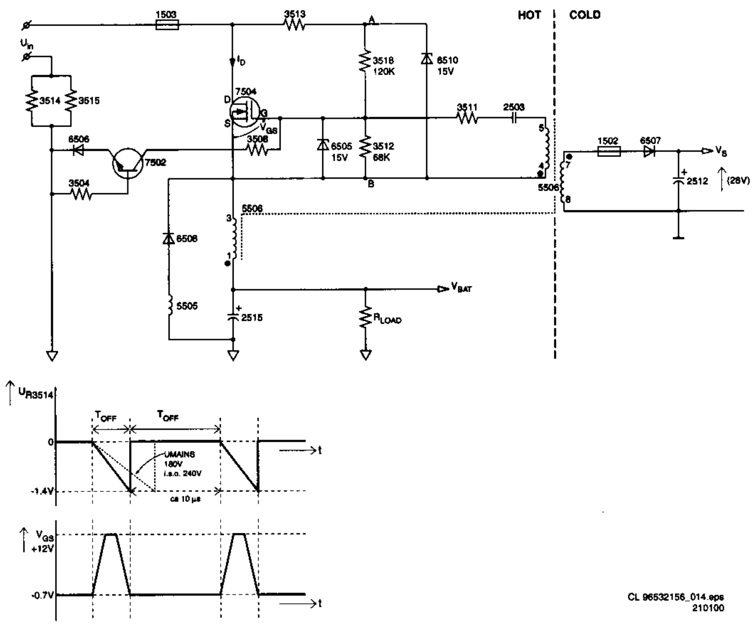

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Figure 9-6

At start-up of the main supply, C2515 can be assumed as being a shortcircuit. U_{AB} will be 15 V (R3513, D6510) and U_{GS} of the FET will be +5.4 V (voltage division over R3512 and R3518). The FET will be driven into saturation (same as closing switch 'S'). The drain-current will increase linear in time. With other words: resistors R3513 and R3518 will start the oscillator.
The voltage across the co-coupled coil (4, 5) is also positive and will keep the FET into conductivity.

The drain-current will also flow through R3514//R3515. The voltage on the base of TS7502 will be +0.8 V due to the stabilisation circuit (which is explained further). At increasing current, the emitter-voltage of TS7502 will get more negative. When this voltage reaches -0.7 V, TS7502 will be driven into conductivity and consequently connect the gate of TS7504 to earth; the FET will block (same as opening switch 'S'). The maximum drain-current is: 0.7 V / (R3514//R3515) = 1.4 A.
The voltage polarities on L5506 will invert, keeping the gate of TS7504 negative via the co-coupled coil (4, 5). The voltage on the secondary winding of L5506 (7, 8) will be positive, generating the +28 V audio supply voltage via D6507 and C2512.

The sudden current interruption in the primary coil, will induce a counter-e.m.f. that wants to maintain the current via the 'freewheel' diode D6508. This current is linear decreasing in time and as it is also flowing through R3414//R3415, TS7502 will be blocked after a certain time period. The gate of the FET will be again made positive, is driven into conductivity and the cycle starts again.

Stabilisation of V_{BAT}:
The output voltage V_{BAT} will be determined by: $V_{BAT} = V_{IN} * T_{ON} / (T_{ON} + T_{OFF}) = V_{IN} *$ duty-cycle.
To stabilise the output voltage, a feedback loop is implemented, which will reduce T_{ON} when V_{BAT} increases and vice versa.

Via a voltage divider, excisting of (1 %) resistors R3507, R3510 and R3527, a voltage of 2.5 V (when V_{BAT} = 141 V) is fed to the input of precision shunt regulator 7506. This regulator will conduct, a current will flow through R3524 and TS7505 will be driven into conductivity. The base of TS7502 will now be set at a certain positive voltage. As this transistor switches the FET TS7504 on and off, this circuit can determine the dutycycle.

E.g. when the load increases, V_{BAT} will decrease. As a consequence, the input-voltage of regulator 7506 will decrease, resulting in a lower current. Through that the emitter-base voltage of TS7505 will diminish.
The current through R3504 will decline, changing the base-voltage of TS7502 and through that the T_{ON} (will increase) of the FET. The output voltage V_{BAT} will rise.
If the load continues to increase, the regulator will block at a certain moment, the collector-current of TS7505 will now be zero. If there flows no current through R3504, T_{ON} will now be maximum (I_{MAX} = 1.4 A). This is the point where V_{BAT} will be below 141 V, and at further increasing load will be switched off (The voltage across the co-coupled coil (4, 5) will decrease due to the increasing load. Therefore the voltage on the gate of TS7504 comes below the threshold voltage. The supply switches off and an audible hiccuping can be heard).

On the other hand when the load decreases, V_{BAT} will rise. As a consequence, the input-voltage of 7506 will also rise resulting in a higher current. The current through R3504 will rise, changing the base-voltage of TS7502 and through that the T_{ON} (will decrease) of the FET. The output voltage V_{BAT} will be reduced.

If, for instance, V_{IN} will decrease (e.g. U_{MAINS} is 180 V i.s.o. 240 V), the slope of the drain-current will be flattened, through which the FET will be longer into conductance, keeping V_{OUT} constant.

If, for any reason, the stabilisation circuit might fail, the output voltage V_{BAT} can never exceed 200 V (via D6514). D6514 will form a shortcircuit, V_{BAT} will drop and the set will switch off (this will result in an audible hiccuping of the supply).

Set to 'STANDBY" (via RC):
When the set is switched to 'STANDBY' via the Remote Control, the Main supply will be switched off.
This is done by the circuit around TS7529 (see diagram A1): During 'ON'-state the Main supply is fed with line pulses via the STANDBY line. They are rectified and smoothed via D6517, D6516 and C2530 and fed to TS7529. Because they are less than -20 V, this transistor will be blocked.
When these pulses are stopped (STANDBY), TS7529 will be saturated and TS7502 will be switched off. This will switch off the Main supply.

Set to 'ON' (via 'STANDBY'):
At the moment the set is switched 'ON', the HOP is not working (as much as possible IC's are made voltageless during 'STANDBY'). Therefore it is impossible that the STANDBY line carries line-pulses, so the main supply cannot start up. This problem is solved via the 'low power start-up' possibility of the HOP.
Via pin 22, the HOP receives, via the STANDBY_INFO line from the OTC, a voltage of 5.2 V coming from the Standby supply. The result will be that the HOP will generate pulses with a nominal T_{OFF} and T_{ON} growing from 0 to 30 % of the nominal value.
This signal is unchanged until the Main supply is switched 'ON' and the HOP the correct I^2C-command POR-bit) has received.

Guarding circuit:
The negative pulses on the secondary winding of L5506 are rectified by D6520 and smoothed by C2535. The resulting negative DC-voltage will keep TS7510 blocked, even as TS7511.
When something happens in the Main supply through which these pulses will decrease, the DC-voltage will increase. TS7510 starts to conduct, even as TS7511. Via R3541 and D6522 this situation will be maintained (thyristor principle). The collector of TS7511 drives via R3538 a positive pulse back to the OTC (named STANDBY(POR)). The OTC will now switch off the Main supply via the STANDBY_INFO signal.

SSB

There are 5 different voltages located on the SSB: +33 V, +11D V, +8 V, +5.2 V and +5 V.
+5.2 V is the Standby voltage, it should always be present. The 8 V is derived from the 11D V with stabiliser 7906. The 11D voltage is only present when the line-drive pulses start the deflection.
The 8 V is used to switch the +5.2 V with transistor 7905 to supply the +5 V.

9.1.4 Control (diagram B5)

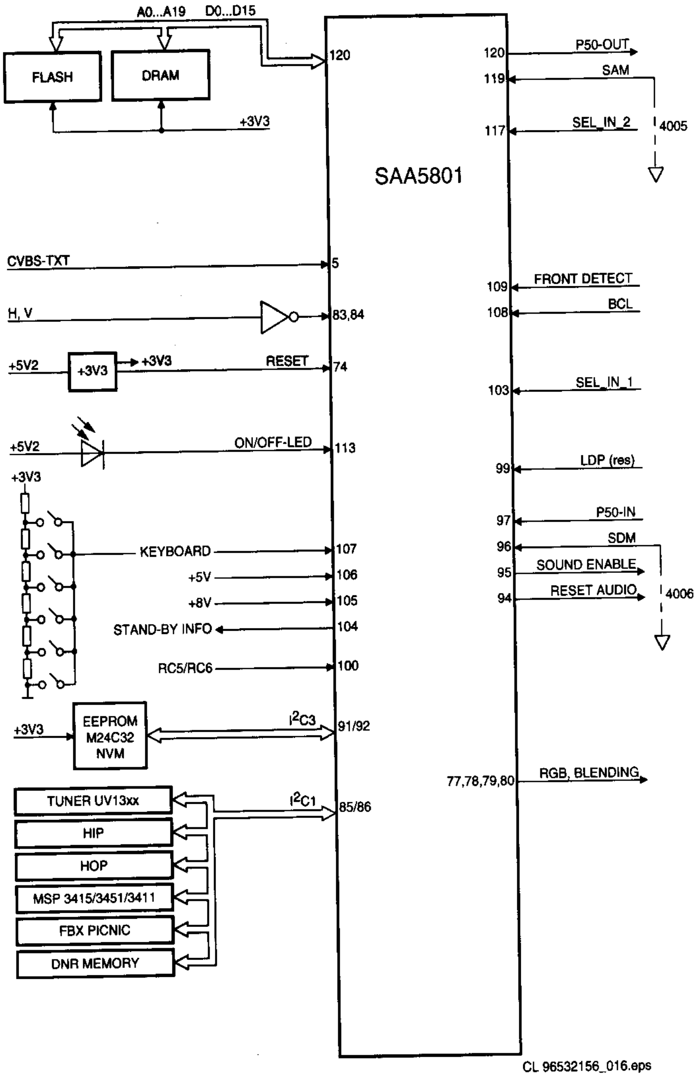
A0...A19
D0...D15
FLASH
DRAM
+3V3
SAA5801
120
5
83,84
74
113
107
106
105
104
100
91/92
85/86
CVBS-TXT
H, V
+5V2
+3V3
+3V3
RESET
+5V2
ON/OFF-LED
+3V3
KEYBOARD
+5V
+8V
STAND-BY INFO
RC5/RC6
+3V3
EEPROM
M24C32
NVM
I2C3
I2C1
TUNER UV13xx
HIP
HOP
MSP 3415/3451/3411
FBX PICNIC
DNR MEMORY
120
119
117
109
108
103
99
97
96
95
94
77,78,79,80
P50-OUT
SAM
SEL_IN_2
4005
FRONT DETECT
BCL
SEL_IN_1
LDP (res)
P50-IN
SDM
SOUND ENABLE
RESET AUDIO
4006
RGB, BLENDING

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Figure 9-7

OTC

The SAA5801 (IC7001) is called the OTC (OSD, TXT and Control). In this IC, the microprocessor and the TXT-decoder (level 2.5) are integrated.
Some of its functions are:

- Set control.
- TXT/OSD acquisition.
- RGB-outputs to the HOP
- Menu blending; for blending the contrast is software controlled.
- I/O-ports for I^{2}C, RC5, LED, and service modes.
- Error code generation.

The software for EM2E can be 2 MB (Megabyte).
For TXT-data 1000 pages can be stored in IC7007. This is a DRAM of 4 Mbit and this IC is also used to store data of a working set.
The Non Volatile Memory IC7011 is a 4 kB version M24C32W6.

All ICs in this part are supplied with 3V3. For this voltage a 3V3 stabiliser is used (IC7005).
When the 3.3 V is available, a POR is generated with TS7003/7004 to wake up the OTC. During the reset all I/O pins are high.
When a POR is generated the TV-set is in Standby mode.

Via pins 105 and 106 the 8 V and the 5 V are sensed. If one of them is not present, the Main supply is switched off (set in protection and the red LED will blink at 3 Hz). The OTC will generate an error code to indicate what was wrong.

The horizontal (HD100) and vertical (VSYNC) sync pulses are also fed to the OTC for stable OSD and TXT.

The RGB-outputs (77/78/79) together with fading (pin 80) are fed to the HOP. The fading pin has a double function: it is used for making a transparent menu and as fast-blanking signal for TXT.

I^{2}C-busses

In the EM2E-chassis with OTC-processor there are two I^{2}C-busses used:

- Slow (max. 100 kHz) hardware I^{2}C-bus (called I^{2}C1), used for all IC communication.
- Separate short bus (called I^{2}C3) for the Non Volatile Memory (NVM) to avoid data corruption.

NVM

The Non Volatile Memory contains all set related data that must be kept permanently, such as:

- Software identification.
- Operational hours.
- Error-codes.
- Option codes.
- All factory alignments.
- Last Status items for the customer + a complete factory recall.
- Txt featuring (keeping habit watch data).
- EPG data.

9.1.5 Tuner & IF (diagram A7 & B2)

The tuner UV1316 is I^{2}C-controlled and is capable of receiving off-air, S- (cable) and Hyperband channels:

• Low	44 - 156 MHz
• Mid	156 - 441 MHz
• High	141 - 865 MHz

The tuning is done via I^{2}C. The reference voltage on pin 9 is 33 V. This voltage is derived from the 180 V (from the LOT) via a resistor of 120 kΩ and a zenerdiode. The OTC together with the HIP control the tuning procedure. There is also automatic switching for the different video systems.

The IF-filter is integrated in a SAW (Surface Acoustic Wave) filter. The type of this filter is depending of the standard(s) that has to be received. Two SAW filters are used: One for filtering picture-IF and the second-one for sound-IF. An extra filter (5403), tuned at 40.4 MHz, is necessary for L/L' sets with 6.5 MHz sound to suppress the neighbour channel.

The output of the tuner is controlled via an IF-amplifier with AGC-control. This is a voltage feedback from pin 62 of the HIP to pin 1 of the tuner. AGC take-over point is adjusted via the service alignment mode 'Tuner AGC'. If there is too much noise in the picture, then it could be that the AGC setting is wrong. The AGC-setting could also be mis-aligned if the picture deforms with perfect signal. The IF-amplifier amplifies too much.

The video IF-signal is fed to pins 2/3 of the PLL-controlled IF-demodulator. The voltage controlled oscillator of the PLL is adjusted via the service menu 'IF AFC'. If the alignment is correct then the displayed frequency in the installation menu is the same as the applied frequency from a generator. The external coil L5408 connected between pins 7/8 is used as reference. The demodulated IF-video signal is available at pin

10 of the HIP. In this video signal there is a rest of sound carrier, which is filtered by the sound trap 1407.
Then the signal is again fed to the HIP on pin 12 where the group delay can be corrected, dependent on the standard that is received. On pin 13 the CVBS-signal becomes available which is used for further processing in the television. Via TS7322 the signal is supplied to EXT1 and back into the HIP on pin 14 to the source/record selection.

To realise quasi split sound the IF-signal is fed to the HIP on pin 63/64 via SAW-filter 1405. The FM (or AM for L-norm) - modulated signal is available on pin 5 and is fed to the audio demodulator MSP34xx.

9.1.6 Video: High-end Input Processor (HIP, diagram B2))

In the EM2E the TDA932xH input processor is used, which contains the following functions:
- IF demodulation.
- Group delay correction.
- AFC signal generation, used to track drifting transmitters.
- Sound carrier re-generation (SIF).
- AM demodulation.
- Sync acquisition, delivering HA and VA.
- Switching off IF-filtering.

The HIP has various inputs.
- Full matrix switch with:
  - 2 CVBS inputs
  - 2 Y/C (or additional CVBS) inputs
  - 1 CVBS front end input
- Two RGB inputs and 2 status-inputs

Outputs: Three separate switchable outputs can be used:
- 1 YUV-output is fed to the PICNIC
- 2 CVBS outputs: One for Teletext Dual Screen and the other for output to EXT2 to have WYSIWYR (What you see is what you record)

I/O-switching: The external signals are fed directly to the I/O part of the HIP with status from pin 8 of SCART. On the HIP there are two status inputs available (pins 15, 17) with two voltage levels:
- 4:3 -> 2.2 V
- 16:9 -> 5.5 V

The input signals from the Front I/O are fed to the HIP and front detection is also fed to the OTC.
EXT1 is full SCART: thus CVBS and RGB. The RGB-selection is done in the HIP.
EXT2 is meant for VCR and has therefore some additional signals in relation to EXT1 but no RGB. EXT2 has also the possibility for Y/C_in and Easylink-Plus (P50). Y_in is with pin 20 and Chroma in with pin 15. Easylink is handled via pin 10 of the SCART and this is a bi-directional communication.

Easylink supports the next features:
- Signal quality and aspect ratio matching
- One touch play
- One touch text
- PIP
- Pre-set download
- WYSIWYR
- Automatic Standby

With Easylink-Plus is added:
- Country and language installation
- System Standby
- Intelligent set top box features
- NexTView download
- Timer record control
- VCR control feature

Video processing

The sandcastle-pulse of the HIP will not be used for synchronisation. The HOP will generate synchronisation signal derived from the feature box (PICNIC) signals. If a VCR is connected, there is also an automatic correction for Macrovision. This is active for the external sources and the pre-sets 0, 90-99.
The HIP itself (no external voltage) controls the Y/C switch in the HIP.
The chrominance decoder in the HIP is full multistandard: PAL/SECAM/NTSC.
Two different crystals can be connected to the pins 54 & 57 without any alignment. The crystals are also used as a reference for the synchronisation. A digital control circuit that is locked to the reference signal of the colour decoder determines the start-up of the sync. This crystal may only be replaced by the original one. If just a crystal is taken, the internal capacitance will be different and the effect will be that there is no colour.
In the HIP a sync separation has been integrated; the HIP delivers the HA and VA 50Hz/60Hz to the PICNIC. On pin 59 there is the 1fH sandcastle but this is not connected to any circuit and only used internally for the colour demodulator. The 2fH-sandcastle signal is generated by the HOP.

9.1.7 Video: Feature box (PICNIC, diagram B3))

Introduction

The basic function of the Feature box (FBX6) is picture improvement, and depending on the version, several scan conversion methods can be applied. The PICNIC (SAA4978H) is the central key component.
In the EM2E-chassis the featurebox is integrated on the SSB. The PICNIC is used for the 100Hz conversion. In the PICNIC the following functions are present:
- The ADC.
- The DAC.
- The 100 Hz conversion.
- The Panorama mode.
- The noise limiter (DNR).
- The contrast improvement.

All these functions are integrated in one IC: SAA4978H, 160 pins QFP

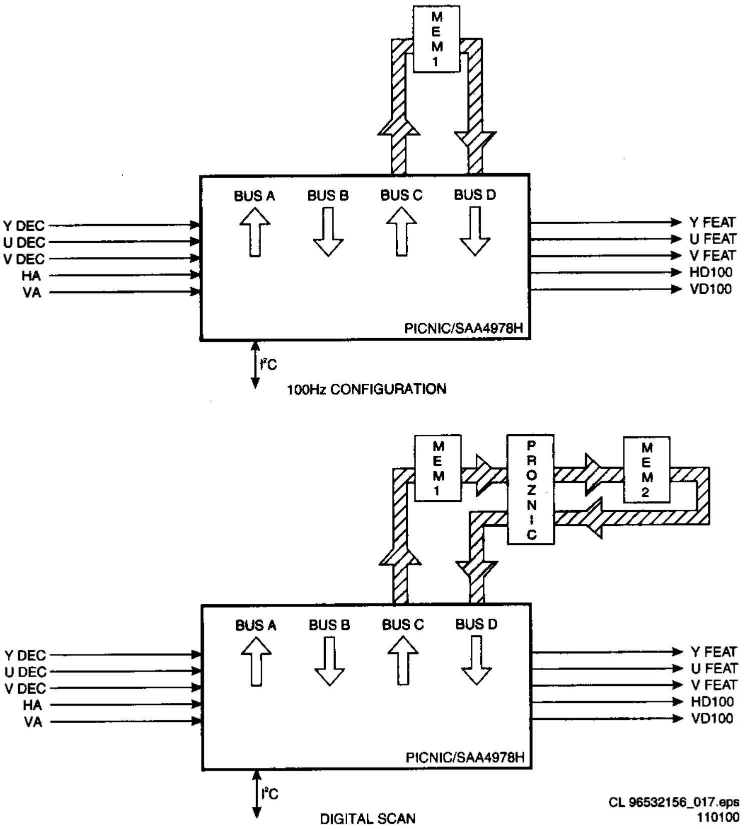
ADC/DAC

Analogue to Digital conversion is done with three identical 9-bit ADC's.
Digital to Analogue conversion uses three identical 10-bit DAC's.
In the PICNIC there are three 9 bits ADCs present for Y,U,V. For digitising the Y (luminance) 9 bits are used, to realise a more detailed picture. The 9 bits are only internally used. Via dithering the 9 bits are reduced to 8 bits and that data is stored into the memory. The data in the memory is fed back to the PICNIC and via undithering the data is again reproduced 9 bits for processing.
U/V (colour difference signals) is also sampled with 9 bits. These two 9 bit data streams are multiplexed to 4 bits data streams. This reduction can be allowed, as the perception for colours by the human eye is less sensitive as for luminance.

100 Hz conversion

The main task of the PICNIC is the conversion from 50Hz to 100Hz for YUV and HV-sync. In order to remove 'large area flicker' (especially visible in a white picture), the field-rate of the video is doubled by the FBX6. A 50/60 Hz frame frequency is converted to 100/120 Hz. Also the line frequency (16 kHz) is doubled (32 kHz). Basically, when the video input contains fields A, B etc..., the conversion provides an AABB sequence on the display. The actual conversion is done in the first Field Memory by reading it twice at double speed, while writing it once.

PROZONIC



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110100

Figure 9-8

To the PICNIC external IC's are connected dependent of the features.
If EM2E has only 100Hz then only one memory-IC is used to store one frame.
For sets with Digital Scan the PROZONIC (IC7708, SAA4990H) has been added with two memory-ICs (IC7714/7715). It is an abbreviation for PROgressive scan Zoom and Noise reduction IC.
When applying this, the 2nd Field Memory has to be installed.
The following functions are available:

- Line flicker reduction (Digital Scan): this is a feature to reduce the 25 Hz interlace line flicker.
- Dynamic Noise Reduction: noise affected signals can be improved by combining the pixel values of the current and past video fields. This is however only possible in areas without movement.
- Variable Vertical Sample Rate Conversion
- Synchronous No Parity Eight bit Reception an Transmission interface (SNERT-bus)

Depending on the chassis model, the FBX6 can have the following specification:

Featurebox 6 diversity	
Set	Chipset
EMG 1fH	
EMG 2fH	1 Memory
EMG 2fH DNR	1 Memory incl. DNR
EMG 2fH Dig. Scan	PROZONIC + 2 Memories

Dual Screen compression

The PICNIC can provide horizontal video compression up to 50 %. The compress mode can be used to display dual screens for instance with Teletext (only for widescreen sets).

Panorama

To fit 4:3 pictures into a 16:9 display, a panoramic horizontal distortion can be applied to make a screen-fitting picture without having black sidebars or lost video.
The centre horizontal gain is programmable and the side gain is automatically adapted to make a screen-fit.

Automatic Aspect Ratio Adaptation (AARA)

This feature uses data from the 'black bar detection circuit' to adapt the vertical and horizontal amplitude to an aspect ratio belonging to the display without showing the black bars.

CTI

At CVBS video signals, the bandwidth of colour signals is limited to 1/4 of the luminance bandwidth. Transients between areas of different colours are therefore not very sharp. The PICNIC can steepen these transients artificially with a time manipulation algorithm.

Dynamic Contrast

To make the contrast (black/white) range wider, Philips has invented Dynamic Contrast. It uses the digital memory used in 100 Hz sets. It measures every A-field (25x/s) and digitally analyses where on the greyscale most of the image is located. If it's a relatively dark image, the lighter part of that image is stretched towards white, so that more contrast will become visible in that picture. If it's a relatively light image, the darker part of that image is stretched towards black, so that these darker parts will have more contrast. When the image is in the middle of the greyscale, both dark and light parts are stretched.

9.1.8 Video: High-end Output Processor (HOP, diagram B4)

General

In the HOP (High-end Output Processor, TDA9330) the video processor and digital deflection processor are integrated. The main functions of the HOP are:

- Video control (contrast, brightness, saturation, etc.).
- 2nd RGB interface for OSD/TXT.
- Peak White Limiting.
- Cut-off control and White Drive (RGB outputs).
- Geometry control.

The YUV-signals from the PICNIC are fed to the HOP. In the HOP, the video and geometry control parts are integrated. Also the RGB-signals from TXT/OSD are inserted via the HOP. This IC has all functions from a video processor and geometry control (like the DDP in MD2). The geometry part delivers the H-drive, EW-drive and also a drive signal for rotation. The internal V-drive circuit of the HOP is not used (is explained further on).

Video Control

After conversion to RGB again, the signals can be controlled for Saturation, Contrast and Brightness.

2nd RGB interface for OSD/TXT

On pins 35 - 38 the RGB and fast blanking from the OTC (OSD and TXT) are inserted.

Peak White Limiting

On pin 43 there is a Peak White Limiting signal line (PWL). If the beam current (EHT-info line) increases, then the EHT-info voltage will decrease. PWL is controlled by average limiting via R3343/C2333.

Cut-off control

Switching the TV to Standby:

1. Vertical scan is completed.
2. Vertical flyback is completed (the horizontal output is gated with the flyback pulse, so that the horizontal output transistor cannot be switched on during the flyback pulse).
3. Slow stop of the horizontal output is started, by gradually reducing the 'on' time at the horizontal output from nominal to zero (this will take 50 ms).

4. At the same time the fixed beam current is forced via the black current loop for 25 ms. This is done by setting the RGB outputs to a maximum voltage of 5.6V.

In the EM2E a 'one-point' cut-off control is used:
A current of 8 µA (for cut-off) is fed to pin 44 of the HOP. This is done with a measurement pulse during the frame flyback. During the 1st frame, 3 pulses are generated to adjust the cut-off voltage at a current of 8 µA.With this measurement the black level at the RGB-outputs is adjusted. So at start-up there is no monitor pulse anymore. At start-up, the HOP measures the pulses which come back via pin 44. The RGB-outputs have to be between 1.5 V and 3.5 V. If one of the outputs is higher than 3.5 V or one of them lower then 1.5 V, the RGB-outputs will be blanked.

Geometry control
All geometry control is done via I^{2}C and the data is stored in the NVM (IC7011) of the SSB.

Line drive (LINEDRIVE1).
Line drive is derived from an internal VCO of 13.75 MHz. As a reference an external resonator is used (1301). The internal VCO is locked with the HD100-pulse, which comes from the PICNIC. The 'PHI-2' part in the HOP receives the HFB_X-RAY_PROT (pin 13) to correct the phase of the line drive. The EHT-info is supplied to pin 14 (DYN-PHASE-CORR) to compensate picture breathing depending on the beam current. Service tip: This is not used at the moment, therefore EHT-compensation in the service menu is put to zero.

Frame drive (FRAMEDRIVE+).
The VD100 signal from the PICNIC will be extended for 16.5 lines by the circuit around TS7309 and 7311. The resulting signal (VDHOP) will drive TS7310. This will result in the (asymmetric) FRAMEDRIVE+ signal.
Note: The Frame outputs (pins 1/2) of the HOP are not used!

East/West drive.
At pin 3 the E/W-drive is available. Pin 4 is a feedback input for the EHT-info and is used to prevent pumping of the picture. EHT varies also dependent of the beam current. For widescreen without load this is 31.5 kV and with load (1.5 mA) 29.5 kV.

Frame rotation (only for 16:9 sets):
For frame rotation a control voltage is used from pin 25 of the HOP. This voltage can vary from 0.4 V till 4 V.

Guarding protections:
- Flash detection:

When a flash occurs, the EHT-info will become negative very fast. Via D6303/D6304/R3316, TS7303 starts to conduct. This makes pin 5 of HOP high. When pin 5 of HOP is high, then the output (pin 8) is immediately stopped. If H-drive stops then also pin 5 will be low again, which will reset the flash detection. A bit (FLS) will be set in an output status register, so via the OTC it can be seen when there was a flash. This FLS-bit will be reset when the OTC has read that register.

- HFB protection:

If the HFB is not present then this detected via the HOP. The OTC puts the TV into protection and reads a register in the HOP. An error code will be generated.

9.1.9 Synchronisation (diagram B3 & B4)

The HIP video processor provides vertical and horizontal sync pulses VA and HA that are synchronised with the incoming CVBS signal. These pulses are fed to the PICNIC where they are doubled to be synchronous with the 100 Hz picture. The outgoing pulses, VD100 and HD100 are fed to the HOP that supplies the vertical and horizontal drive pulses and the 100 Hz (2fH) sandcastle pulse.

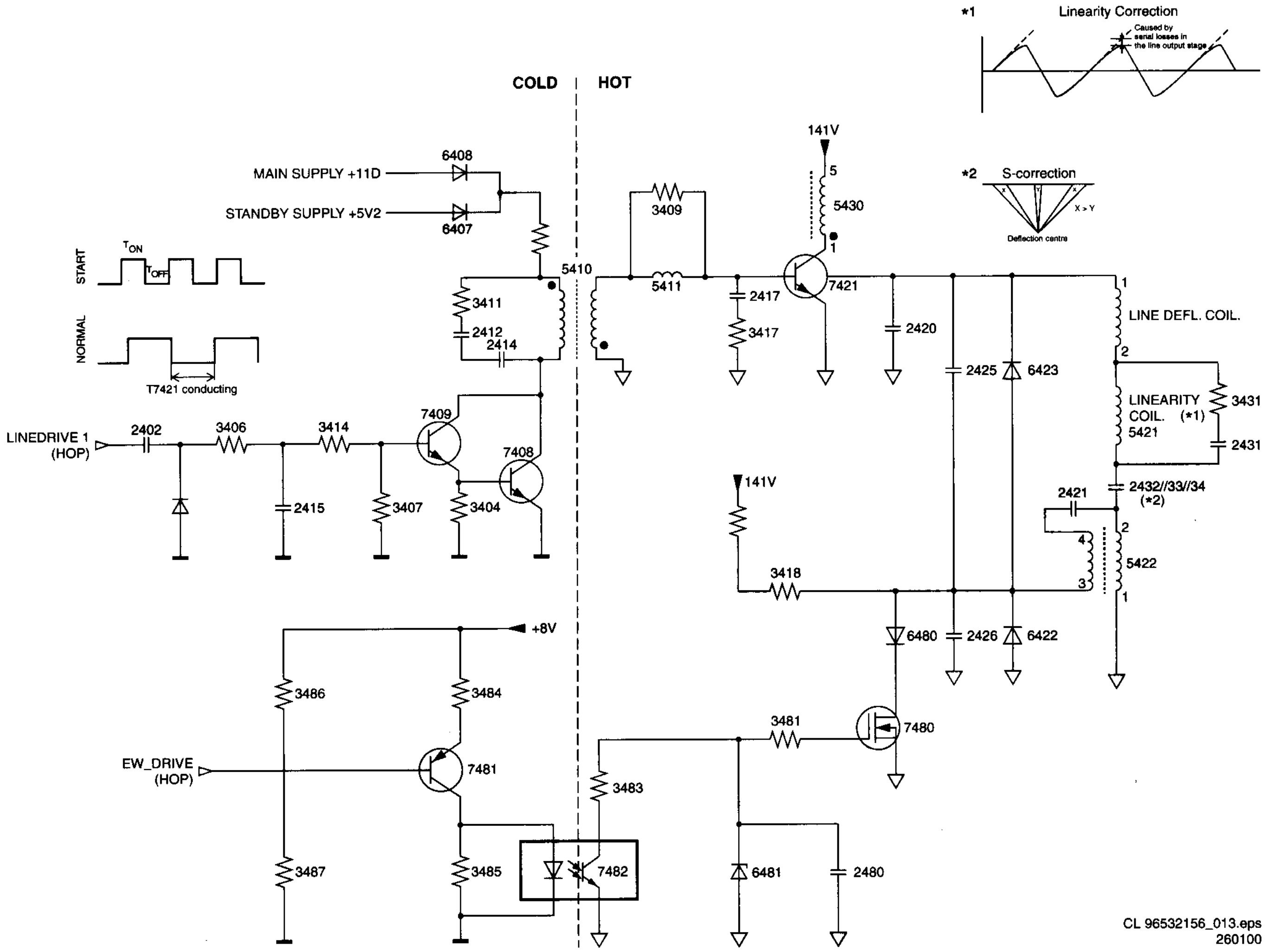
The VD100 pulse from the PICNIC is only one line long. Therefore this pulse is converted into a VDHOP signal by a 530 µs monostable oscillator (extended by 16.5 lines). This signal is on block function level equal to VSYNC and FRAMEDRIVE+.

The OTC is synchronised on the HD100 pulse from the FBX and on the VSYNC for the synchronisation of TXT/OSD/EPG

When no CVBS is offered to the video processor, the VA and HA pulses are switched off by the HIP, and the VD and HD pulses are then generated by the PICNIC. This to assure a stable OSD.

9.1.10 Horizontal (line) deflection (diagram A3)

Driving the line output stage


*1
Linearity Correction
Caused by serial losses in the line output stage
*2
S-correction
X>Y
Deflection centre
COLD
HOT
141V
MAIN SUPPLY +11D
STANDBY SUPPLY +5V2
6408
6407
5430
5410
3409
5411
3411
2412
2414
2417
3417
7421
2420
LINE DEFL. COIL
LINEARITY COIL. (*1) 5421
3431
2431
2425
6423
2432//33//34 (*2)
2421
5422
START
NORMAL
T_ON
T_OFF
T7421 conducting
LINEDRIVE 1 (HOP)
2402
3406
3414
7409
7408
2415
3407
3404
141V
3418
+8V
6480
2426
6422
3486
3484
3481
7480
EW_DRIVE (HOP)
7481
3483
3487
3485
7482
6481
2480
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260100

Figure 9-9

The HOP (located on the SSB) generates the line-drive pulses (LINEDRIVE1), which have a frequency of 31250 Hz (T = 32 µs).

When the LINEDRIVE1 signal is high, TS7409 and TS7408 will conduct. A constant DC voltage will be applied across L5410, causing a linear increasing current through this coil. The secondary voltage of L5410 has a negative polarity so that TS7421 will block. When switching on the set, the current through L5410 is supplied by the 5V2 Standby supply (via D6407), and taken over by the +11D voltage (via D6408) of the main supply.

When the LINEDRIVE1 signal becomes low, TS7409 and TS7408 will block. The voltage polarity across the primary winding of L5410 will invert. The positive voltage on the secondary winding will now drive TS7421 into conductivity. Because of the storage time of the line transistor (TS7421), L5410 cannot transfer its energy immediately to the secondary side. This may result in high voltage peaks on the collector of TS7409 and TS7408. To prevent that these peaks will damage the transistors, a 'snubber' circuit (C2414, C2412 and R3411) will suppress them.

When the LINEDRIVE1 signal is high again, the above-described sequence starts again. Circuit L5411 and R3409 will increase the switch-off time of the line transistor.

The line stage will be started via the 'slow start' principle. During start-up, the HOP generates line drive pulses with a small T_{ON} and a high frequency (50 kHz); T_{OFF} will be constant and T_{ON} will be gradually increased until the duty-cycle is 50 % (normal condition). The time interval from start to normal condition takes about 150 ms. When switching off, the same procedure is followed, but now in reverse order.

Operation of the line output stage

To explain the operation of the line output stage, we use the following start conditions:

- C2433 is charged to max. 141 V (V_{BAT})
- TS7421 is driven into conductivity.

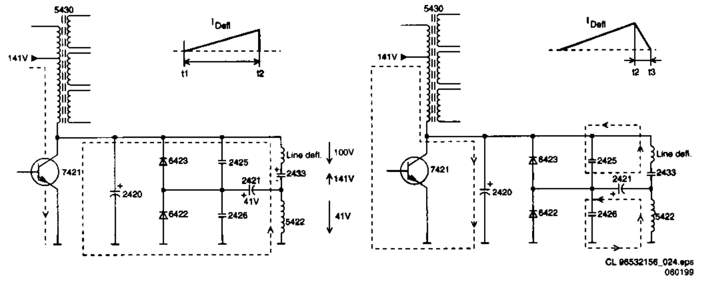
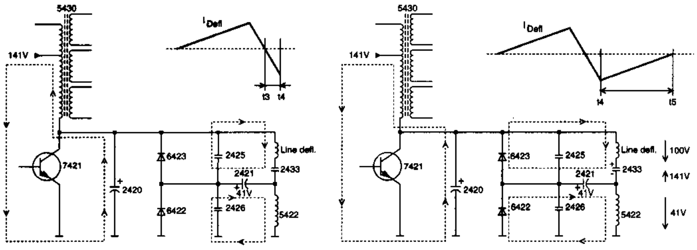

5430
141V
I_{Defl}
t1
t2
t3
7421
6423
2425
2421
2433
2420
6422
2426
5422
Line defl.
100V
141V
41V
CL 96532156_024.eps
060199

Figure 9-10

Period t1 - t2:
When TS7421 is driven into conductivity, the capacitor voltage of 141 V, will be divided across bridgecoil L5422 and the deflection coil (conn. 0317). Due to the chosen inductance values, there will be 100 V across the deflection coil and 41 V across L5422. The linear increasing current in the deflection coil will result in a spot moving from the centre of the picture tube to the right.
The voltage across L5422 will also charge C2421 (41 V - 0.7 V).

Period t2 - t3:
At the moment the LINEDRIVE signal becomes high, TS7421 will stop conducting. In the coils a voltage will be induced, trying to maintain the current. The current through the line deflection coils continues to flow through C2425 and C2421 and the current through L5422 continues to flow through C2426 and C2421. The energy stored in the line deflection coil is passed to C2425, and the energy of L5422 to C2426.
The resonance-frequencies of these 2 LC-circuits define the flyback time of the spot from the right side of the picture tube to the left.
On average no current flows through C2421 and thus the voltage across this capacitor remains constant.



CL 96532156_025.eps
231299

Figure 9-11

Period t3 - t4:
As for the period t2 - t3; but now the current flows in the opposite direction, since the voltage across C2425 and C2426 is higher than the voltage across C2433 and C2421.

Period t4 - t5:
The coils want to maintain the negative current and will charge the capacitors negative. Because of this, D6422 and D6423 will conduct. The voltage is 100 V across the deflection coil and 41 V across L5422. As both diodes conduct, we may consider the voltage to be constant. A linear current flows with the same changing characteristics as in period t1 - t2. The spot now moves from the extreme left of the picture tube to the centre. Before the current becomes zero, and the spot is located in the centre of the frame, TS7421 reverts back into conductivity. First a short negative current will flow. The cycle starts again.

The linearity correction

A constant voltage across the horizontal deflection coil should result in a linear increasing saw-tooth current. This however is not the case as the resistance of the coil is not negligible. In order to compensate for this, a pre-magnetised coil L5421 in series with the deflection coil is used. This coil ensures that during time interval t1 - t3 the circuit-resistance will be higher than during t4 - t5. L5421 is called the linearity coil.
To avoid self-oscillation, R3431 and C2431 are placed parallel to L5421.

The S-correction

Since the sides of the picture are further away from the point of deflection than the centre, a linear saw-tooth current would result in a non-linear image (the centre would be scanned slower than the sides). To solve this, the deflection current for the right- and left side will be reduced.
C2433 is charged quadratic during time interval t1 - t2. Left and right the voltage across the deflection coil decreases, causing the deflection to slow down. In the centre, the voltage increases and the deflection will be faster. An S-shaped current will have to be superimposed onto the saw-tooth current. This correction is called finger-length correction or S-correction. C2433 is relatively small, as a result of which the saw-tooth current will generate a parabolic voltage with negative voltage peaks.. The current also results in a parabolic voltage across C2421, resulting in the finger-length correction, proportionally increasing with the picture width. The EW-DRIVE signal will ensure the largest picture width in the centre of the frame. Here the largest correction is applied. The larger the picture width, the higher the deflection current through C2433.

The E/W-correction

A line, written at the upper- or lower side of the screen, will be larger at the screen centre when a fixed deflection current is used. Therefore the amplitude of the deflection current must be increased when the spot approaches the screen centre. This is called East/West correction.
The EW-DRIVE signal is generated in the HOP and will drive FET TS7480 via TS7481 and optocoupler TS7482. TS7480 will charge capacitor C2423 more or less, increasing the deflection current when reaching the centre of the screen.

Secondary line-voltages

During the blocking time of TS7421, the magnetic energy of coil 1 - 5 of the LOT will be transferred to electrical energy in the secondary winding. Via rectifying and smoothing, the several secondary supply voltages will be generated:

- EHT, Focus and Vg2-voltage
- +180V for the CRT panel (pin 8 LOT)
- +11D for the line deflection (pin 12 LOT)
- +13VLOT for the frame deflection (pin 6 LOT)
- -15VLOT for the frame deflection (pin 3 LOT)
- Filament voltage (pin 9 LOT)

The EHT-INFO signal is derived via R3450//R3451. This signal decreases while the beam current increases. It is fed to the HOP to compensate for loss of picture width and picture height.

The DYN-FASE-CORR signal is fed to the HOP via C2455 and drives a dynamic phase correction necessary because of beam current variations. This is done by regulating T_{ON} of the line transistor TS7421.

East-West circuit

The moment TS7480 is driven into saturation, C2421 will discharge during the flyback. As a consequence of which C2421 must be charged again during the scan via the conduction diode D6422 (as long as C2421 is not charged to the voltage across L5422, D6422 will conduct). The current in the deflection coil is therefore larger than the current flowing in L5422 (1-2). The voltage across the deflection coil increases, so the picture width increases. When TS7480 blocks, C2421 will not discharge anymore and the voltage across C2421 will remain constant. The result is that the voltage across the deflection coil is minimal. The voltage across coil L5422, however, is maximal. This coil (L5422) consists of a transformer:

- As the current through the coil 1-2 increases (smaller picture width), the current through coil 3-4 decreases. Because of the transformer characteristic a higher voltage will be subjected to coil 3-4, which will counteract the current. The current will diminish even further.
- When the current through coil 1-2 diminishes (larger picture width), the current through coil 3-4 increases.

The EW Drive

The EW drive signal originates in the HOP and is supplied to TS7480. The shape of this signal determines the various geometric correction parameters:

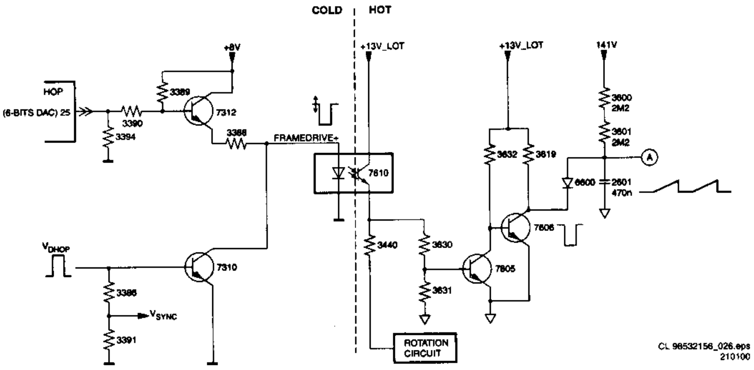
- H amplitude
- EW-parabola
- EW-corner
- EW-trapezium
- Horizontal parallelogram
- Horizontal bow

Beam current correction

The EHT-info at point 10 of the LOT is dependent on the value of the beam current and the voltage divider R3450, R3451 and C2450. The EHT-info is fed to the HOP to trim the contrast and to compensate for the changes in picture-width as a function of the EHT-info, when the high-voltage is decreased. The EHT-info is integrated via C2450 and sent to the gate of the E/W FET (TS7480) as a DC-voltage to correct the EW-current.

9.1.11 Vertical (frame) deflection (diagram A4)

Driving the frame output stage



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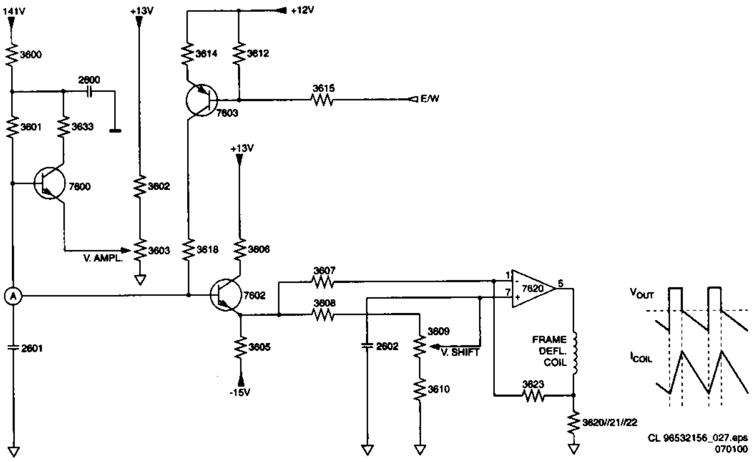
210100

Figure 9-12

The HOP drives the frame output stage. As the HOP is 'cold' and the frame output stage is 'hot', they must be galvanic isolated by means of an optocoupler. In the MG-chassis the HOP generates 3 signals needed for the frame output stage: VDPOS, VDNEG and FRAME ROTATION. To avoid the costs of 3 optocouplers, the frame drive pulse and rotation DC-voltage are added together and then fed to optocoupler TS7610.

This is done as follows: The VD100 signal from the PICNIC (diagram B3 pin 19) is extended for 16.5 lines and inverted via a monostable multivibrator (TS7311 & TS7309, diagram B4). The output signal VDHOP is then superimposed on a DC-voltage from pin 25 of the HOP. The resulting signal is called FRAMEDRIVE+ and is fed to optocoupler 7610 (diagram A4). So this signal contains info for both the frame deflection and the frame rotation.

The circuit around IC7440 will amplify this signal and the output current will flow through the rotation coil. The vertical pulses on this signal are filtered by C2445 to ensure that only a DC-voltage will be supplied to the rotation coil.
The output voltage of the rotation circuit is between -8 and +8 V.



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070100

Figure 9-13

The sawtooth voltage for the frame output stage is not generated by the HOP but by a discrete circuit after the optocoupler 7610: via R3600 and R3601 a linear increasing voltage over C2601 is built up with a large time constant.

The circuit around TS7603 is a current source, driving C2601 with a current value derived from the E/W modulator. This will result in an S-shaped voltage on C2601 (also known as EW-correction).

Flyback generator

The frame output stage is supplied via the +13 V and -15 V coming from the LOT. The output of the amplifier is 0 V_{DC}, so a coupling capacitor is not required.

During the (forward) scan, a supply of +13 and -15 V is sufficient to respond to the slow changing current. The flyback generator puts a voltage of -15 V on pin 3. Because of the voltage drop over zenerdiode D6622 (8.2 V), C2622 will be charged to 19 V: being 13 + (15 - 8.2 - 0.7) V.
During the flyback scan, the change in current per time is much larger, so a higher voltage is required. The flyback generator will now generate a voltage of +13 V on pin 3. Added to the charge on C2622 this will give a flyback voltage of 32 V (depending on the CRT size, this value can differ).

The IC amplifier (IC7620, pin 5) supplies the sawtooth current to the frame deflection coil. The current through this coil is measured via R3620//R3621//R3622 and fed back to the inverting input of the amplifier.
R3624 and C2624 on the output of the amplifier, form a filter for high frequencies and in that way also prevents oscillations. Peak voltages on the output, e.g. as a result of a possible flash, are damped by the clamp circuit consisting of D6619, C2627 and R3627. The network consisting of R3625, R3629 and C2629 form an extra damping circuit.

Protection circuit for bridge-coil and frame output stage

The secondary voltage of bridge coil L5422 is guarded at the diode modulator (D6421/22) via a detection circuit consisting of an 8.2 V zenerdiode (diagram A3). When the bridge-coil is working properly, the average voltage on D6422 is such that this zenerdiode will conduct and will drive TS7652 into saturation via the BRIDGE_PROT signal (see diagram A4). When, for any reason, the secondary side of the bridge-coil is shorted, the average voltage on D6422 will drop below the zener-voltage and TS7652 will block. Now capacitor C2642 will be charged. Transistor TS7407 will start conducting and the STANDBY signal will be grounded via R3403. This will switch off the main supply (see diagram A1).

Via the circuit built around TS7641 the frame output stage is guarded. If the frame output stage is working properly, TS7641 and TS7652 will both conduct and thereby discharging C2642. TS7407 is blocked now, causing the STANDBY signal to be high-ohmic.
If there are frame pulses missing, TS7641 will block and capacitor C2642 can be charged. Transistor TS7407 will now start conducting and the STANDBY signal will be grounded via R3403. This will switch off the main supply (see diagram A1).

9.1.12 Audio (diagram B6, A5 & A6)

Introduction
All EM2E sets contain one of ITT's Multistandard Sound Processing IC's for sound decoding. The diversity arises because each member of the MSP-family handles its own set of sound standards:

- MSP3415D: Europe & AP decoding, Stereo incl. NICAM.
- MSP3451G: Global decoding, Virtual Dolby.

This IC takes care of the main FM sound decoding. AM decoding for the L system is done by the HIP. The demodulated L sound is then again source selected and processed in the MSP. The reason for this is the bad AM detection performance of the MSP. In case of NICAM L however, this is handled by the MSP.

All MSP versions contain digital audio processing, used for the basic left/right stereo sound, such as bass, treble, balance, incredible sound and spatial. In addition to that, the MSP3451 is also able to perform Virtual Dolby, a Dolby approved sound mode for surround sound reproduction with left/right speakers only.

Audio source selection

- MSP3515D (stereo)

This IC is an economised version of the MSP3410 that is used in the MG-chassis. It can cover 2 stereo and 1 mono (AM) input. Since more inputs are required, a separate source selector is used (HEF4052, IC7675). This selector has EXT1, EXT2, FRONT and SC1-OUT (Tuner) as input and is connected to the SCART1 input of the MSP3415. The SCART2 input is not used.

Since the MSP3415 has only one SCART output, which is connected to the SCART1, a constant level output and connection to SCART2 is not available. This is fixed by connecting the HEF4052 input selector to the constant level output and to SCART2 via a so-called 'Régimbeau' switch (IC7652).
This switch is needed to prevent feedback (Larsen effect). When EXT2 is chosen as input signal, and the output of SCART2 is selected, this means that the main picture is also EXT2 and will cause the Larsen effect. To prevent this, the record select must be switched to Tuner. This is especially important when decoders are used, behind a 'transparent' VCR connected to EXT2.

To get a constant level output if the Tuner is selected, the SCART1 output (Tuner at any time), has to be fed back to the input selector and selected as input for the MSP (SCART1 input).

The MSP3415 has no separate output to drive a headphone. The headphone is therefore hardwired (on the LSP) to the main sound output.

- MSP3451G (Virtual Dolby)

The MSP3451, which is used in all versions supporting Virtual Dolby, is capable of supporting 4 stereo inputs and 1 mono (AM) INPUT. Therefore the extra input selector (HEF4052) is not needed.

The MSP3451 is also capable of supporting 2 SCART outputs, so the trick used in the MSP3415 set-up to get a constant level output is not needed.

The MSP3451 has a separate headphone output, so sound control be done separate from the speakers.

Audio decoding
At the input a choice can be made between two IF-signals; SIF and SIFM.
The selected signal is fed to the AGC. After this, an ADC converts the IF-signal to digital.

This digital signal can be processed by 2 demodulation channels. The first one is able to handle FM and NICAM signals. The second one can handle FM and AM signals.

Each channel contains a mixer to shift the incoming signal in the frequency domain. This shift is determined by the value of a DCO.

After the down-mix, the signal is fed, via a filter, to a discriminator. From here the AM, FM or NICAM demodulation can be performed.

Both channels contain an 'automatic carrier mute' function, which automatically mutes the output of the analogue section when no carrier is detected.

After demodulation, the FM-signals are subjected to a de-emphasis operation. After that the matrix of the stereo system is applied.

Audio processing
The sound processing in EM2E is completely done by the MSP3415D for 'Stereo' sets or the MSP3451G for 'Virtual Dolby' sets:

- Volume control is done by the user via the SOUND menu.
- Tone control in 'Stereo' sets is done via the BASS/TREBLE control, in 'Virtual Dolby' sets via the 5-band equaliser.
- Headphone control in 'Stereo'-sets is done via the loudspeaker output of the MSP, no sound control possible. In 'Virtual Dolby'-sets, the MSP has a separate Headphone output so separate sound control is possible.
- Mute control can be done in different ways:
  - Via the SOUND_ENABLE line of the OTC. Used during start-up/switch-off conditions, in order to avoid audible plops.
  - Via the decoding part of the MSP.
  - Via the processing part of the MSP.

The mute on the RC or in the UI is per today a combination of processing mute and SOUND_ENABLE line. When a user mute is done, the processing mute will turn down the volume, after which the SOUND_ENABLE line is switched. De-muting is the other way around. The reasons for this is a technical problem with crosstalk of the headphone into the loudspeakers.

Automatic Volume Levelling (AVL)
One of the features of the MSP-family is AVL. If used, it limits the big volume differences in the broadcast between e.g. news transmissions and commercials or within a movie.
To be able to get a Dolby approval (for the Virtual Dolby sets), the AVL feature must be switchable. Therefore, the AVL feature is customer switchable via the menu.

Audio amplification
The audio amplifier part is very straight forward. It uses an integrated power amplifier IC, the TDA2616. It delivers an

output of 2 x 10 WRMS to 2 full range speakers. A subwoofer is not implemented.

The supply voltage is +28 V, generated by the main supply via L5506.

Muting is done via the SOUND-ENABLE line connected to pin 2 of the amplifier-IC and coming from the OTC. This signal is inverted by TS7730, as a result of which at a high level of the SOUND-ENABLE signal, current is sinked from pin 2 and the IC mutes.

9.1.13 Teletext / NexTView (diagram B5)

Teletext

The TXT-decoder in the OTC gets its video signal directly on pin 5 (from the HIP).
The RGB-outputs are available on pins 77/78/79. Fast blanking is realised via pen 80.
In the previous chassis there was separate memory to store the TXT information. In EM2E the DRAM (IC7007) of the microprocessor is also used for the TXT-decoder.

NexTView

NexTView allows the user to display a program guide on the TV screen that contains extensive information for each program.

This information can be displayed in a number of different summaries:

- DAY: The daily summary shows, from the current moment, the program schedule for several stations for a short time ahead.
- CHANNEL: The channel summary shows the program schedule for one station.
- THEME: The theme summary shows, for each theme, the program schedule of the various stations. These themes consist of sport, film, culture, etc. and is determined from the station side.

NexTView does not have to restrict itself to information about the station that is being viewed, but also offers information about other stations. In the various summaries 3 different commands can be given for the various program overviews. These commands appear as follows:

- WATCH: The set immediately switches over to the station concerned.
- REMINDER: The start time and date and the station of the program concerned is stored in the TV reminder list. The TV will give an OSD-message with the program information, or switch on the set at the correct moment (provided the set is in Standby) and tune to the station concerned.
- RECORD: The timer of the video recorder with ‘Easylink Plus’ is programmed with the data of the program concerned. There has to be a video recorder (with Easylink Plus) connected to SCART2 otherwise the ‘RECORD’ function will not be highlighted. The connection is via pin 10 from SCART. This means that it has to be a full SCART or at least pin 10 has to be wired.

In order to be able to realise NexTView, two teletext type data flows, Data stream 1 and 2, are transmitted with various sub-code pages of information. This data flow can transport limited information (max. 40 pages). Data stream 1 is quick repeating with a repetition time of approximately 20 to 30 seconds. However, Data stream 2 has a much longer repetition time of approximately half an hour and has a large transport capacity.

- Data stream 1 contains information of the station that is being viewed.
- Data stream 2 contains up to one week of advance information from various stations that are covered by the provider.

9.1.14 CRT / SCAVEM / Rotation (diagram F)

RGB amplifiers

On the CRT panel, the RGB amplifier (TDA6108, IC7307) is located. Via the outputs 9, 8 and 7 the cathodes of the picture tube are driven.
The supply voltage for the amplifier is 180 V and is derived from the LOT.

SCAVEM

The SCAVEM-circuitry is implemented in the layout of the picture tube panel. It is thus not an extra module. SCAVEM means SCAn VElocity Modulation. This means that the horizontal deflection is influenced by the picture content. In an ideal square wave, the sides are limited in slope by a limited bandwidth (5 MHz).
SCAVEM will improve the slope as follows: At a positive slope, a SCAVEM-current is generated which supports the deflection current. The first half of the slope the spot is accelerated and the picture is darker, while at the second half of the slope, the spot is delayed and the slope becomes steeper.
At the end of the slope, the SCAVEM-current decays to zero and the spot is at the original position. An overshoot occurs which improves the impression of sharpness. At the negative slope, the SCAVEM-current counteracts the deflection.
During the first half of the slope, the spot is delayed, the slope becomes steeper.
During the second half the spot accelerates, the SCAVEM-current is zero at the end of the slope.

Via the three resistors R33315, R33317 and R3320, Red, Green and Blue are added together and offered to the emitter TS7300. On the collector of this transistor, configured in a common base, the sum of these 3 signals is obtained. Via the emitter follower formed with TS7301, this signal is conveyed to the differentiator C2303, R3309 and R3318. Only the high frequencies are differentiated (small RC-time).
The positive and negative pulses of this signal drive respectively TS7303 and TS7302 into conductivity. The DC setting of the output stage is set by R3304, R3308, R3316 and R3319. The working voltage of the transistors is settled at half the supply voltage.
At the positive section of the pulse, the current flows through R3318, C2307, the SCAVEM-coil and TS7303. At the negative section of the pulse, the current flows through R3318, C2409, the SCAVEM-coil and TS7302.

Rotation

In sets with a rotation coil (widescreen sets ≥ 32"), the amount of frame rotation is adjusted with the DAC-output of the HOP (see also 'Vertical Deflection').

9.1.15 Software related features

Following features are described:

- Smart Local Doming Prevention (SLDP)
- Auto TV
- Switch ON behaviour

Smart Local Doming Prevention (SLDP)

A CRT with an iron shadow mask shows a considerable amount of local doming (due to local heating), resulting in unwanted colour artefacts.
SLDP helps to reduce these artefacts for both 16:9 and 4:3 sets to an acceptable level. It measures the beam current in areas that are sensitive to local doming and reduces the contrast if the beam current in these places exceeds a pre-set threshold.
The chosen solution in EM2E, is based on the PICNIC hardware and software and it uses the histogram measurement of the PICNIC to make a prediction of the local heating of the CRT shadow mask.

With SLDP, local doming is diminished to an acceptable level at the cost of contrast reduction. By using a 'smart' solution for a part of the necessary contrast reduction, the resulting picture remains even more acceptable.
SLDP is not a feature. It's an algorithm that diminishes local doming effects. These effects occur whenever iron mask (and in a limited way invar mask) tubes are applied. Therefore, there is no reason to make it switchable for the customer. However, SLDP can be switched off via the Service Alignment Mode (SAM).

AutoTV

The AutoTV (or 'Automatic Picture Control' or 'Active Control') aims at giving the customer the best possible picture performance at any time. Therefor it does real time processing of the video signal and as a result, it decides to adapt several video parameters throughout the whole chassis.

The AutoTV feature integrates traditional picture performance, AutoTV functionality and 'smart controls' in order to come to a kind of 'supersmart' TV. It can be subdivided in:

- Auto Noise Reduction. This algorithm measures the amount of noise in the incoming video signal (this is done by the LIMERIC part of the PICNIC). As a result of this measurement, the amount of noise in the picture is corrected, starting from that noise level which is annoying for the customer. Which parameters exactly can be used is depending on the hardware.
- Auto Sharpness. This algorithm measures the amount of sharpness via the bandwidth of the incoming video signal and adapts the peaking frequency in the PICNIC according to this info. If the 'sharpness meter' sees the video content as 'sharp', high frequency peaking will be used. On the other hand, if the picture content is seen as 'not sharp', a low/mid frequency peaking is used. There is a coupling between the Auto Noise and the Auto Sharpness algorithm: if noise is present in the video content, then in general the sharpness will be made less aggressive. Special care has to be taken to the interaction of the LIMERIC and the vertical peaking of the PICNIC: a too big amount of vertical peaking increases the visibility of the 2DNR artefacts.

In the EM2E a limited AutoTV control function is used: only a combination of above described features is used in the background in order to improve the set performance, specially focussed on noise reduction.

Switch ON behaviour

First of all, the microprocessor needs to start up: After the power is applied, the 'Standby supply' starts oscillating, generating the +5V2 and +3V3. When ready, a reset (POR) is generated and the OTC is awakened.

During reset, the OTC puts a high level on all his outputs, causing the degaussing relay to close. After the reset, the outputs and inputs of the OTC must be initialised to their default state. The degaussing output of the OTC must stay high for 12 seconds.

Next step is the check whether the set needs to be in Standby or not. Therefore, the NVM content is read and the Standby-bit is checked. If the set is to stay in Standby, there is no further action.

If the set has to be switched 'on', the Standby-info line is pulled low. This results in the low power mode start-up of the HOP. The line drive starts to run on 50 kHz, wakes up the main supply and the +5 V, +8 V and +141 V supplies become available. The OTC waits until the +8 V is fully present. This is done by checking the ADC input of the OTC. A positive result means three times a positive +8 V detection in a row (time between each polling approx. 5 ms). If this detection still fails after 1 second, an error should be generated and the set must be switched to protection (error: "+8 V).

After detection of the +8 V, the MSP must be reset, since it can disturb I^2C traffic when not properly reset. From this moment on, I^2C traffic is possible.

To be sure that the HOP is properly started up, the POR bit of the HOP should be read. If this is not successful, the Standby info has to be put high again and an error code (code 11: HOP) will be generated. If the reading of the POR bit is successful, the starting procedure can be continued.

The Standby info line must be switched high again. The sync mode and the black current stabilisation loop of the HOP must be disabled in order to have a smooth start-up. Within 23.5 ms after reading the HOP POR bit, the HOP has to be started up via the HOP_start commando. If this condition is not fulfilled, the HOP will stop his line drive again and the set will not be able to start up.

During start-up of the deflection, I^2C traffic must be disabled for 250 ms to avoid data corruption. If flashes or spikes are generated during EHT start-up, I^2C data could be disturbed or corrupted.

After deflection is powered up completely, all protection algorithms are set active.
The rest of the NVM content can now be read and the IC's can be initialised according this info.

If SLDP is present in the set, an initialisation of SLDP has to be performed, including a calibration of the beamcurrent ADC.

The sync-mode of the HOP must be switched to active and the black current stabilisation loop in the HOP is switched on. Some extra checking is done to ensure that the loops are completely stabilised. Software sets all the necessary parameters for a correct sound and image and unblanks the picture.

A provision is foreseen to avoid sets in the field that will never unblank, if the picture tube is severely worn out. If the black current stabilisation does not become stable within a time frame of 30 seconds, the picture is unblanked anyway

9.2 Abbreviation list

AARA	Automatic Aspect Ratio Adaptation: algorithm that adapts aspect ratio to remove horizontal black bars; keeping up the original aspect ratio
ACI	Automatic Channel Installation: algorithm that installs TV sets directly from cable network by means of a predefined TXT page
ADC	Analogue Digital Converter
AFC	Automatic Frequency Control: control signal used to tune to the correct frequency
AGC	Automatic Gain Control: algorithm that controls the video input of the featurebox
AI	Artificial Intelligence
AM	Amplitude Modulation
ANR	Automatic Noise Reduction: one of the algorithms of Auto TV
AR	Aspect Ratio: 4 by 3 or 16 by 9
Artistic	see OTC 2.5: main processor
ASF	Auto Screen Fit: algorithm that adapts aspect ratio to remove horizontal black bars but without throwing away video information
ATV	See Auto TV
AUDIO_C	Audio Centre
AUDIO_L	Audio Left
AUDIO_R	Audio Right
AUDIO_SL	Audio Surround Left
AUDIO_SW	Audio Subwoofer
AUDIO-L-PROC	Audio left processed
AUDIO-R-PROC	Audio right processed
AUDIO-SR	Audio surround right
Auto TV	Name for the combination of picture features/improvements which work automatically (ANR / Auto sharpness/ Auto Histo/ambient light).
BC-PROT	Beam current protection
BG	System B and G
BLC-INFO	Black current information
B-SC1-IN	Blue SCART1 in
B-SC2-IN	Blue SCART2 in
B-TXT	Blue teletext
CENTER	Centre speaker
C-FRONT	Chrominance front input
CL	Constant Level: audio output to connect with an external amplifier
ComPair	Computer aided rePair
CRT	Cathode Ray Tube or picture tube
CSM	Customer Service Mode
CTI	Colour Transient Improvement: manipulates steepness of chroma transients
CVBS	Composite Video Blanking and Synchronisation
CVBS-SC1-IN	CVBS SCART1 in
CVBS-SC2 OUT	CVBS SCART2 out
CVBS-SC2-IN	CVBS SCART2 in
CVBS-SC3-IN	CVBS SCART3 in
CVBS-SC4-IN	CVBS SCART4 IN
CVBS-TER	CVBS terrestrial
CVBS-TXT-DS-OUT	CBVBS teletext Dual Screen out
CVBS-TXT-OUT	CVBS teletext out
CVBS-Y-FRONT	CVBS luminance front input
DAC-HOP	Digital analogue converter HOP IC
DBE	Dynamic Bass Enhancement: extra low frequency amplification
DC-filament	Filament supply voltage
DC-PROT	DC protection
DFU	Direction For Use: description for the end user
DNR	Digital Noise Reduction: noise reduction feature of the box
DSP	Digital Signal Processing
DST	Dealer Service Tool: special remote control designed for dealers to enter e.g. service mode
DVD	Digital Versatile Disc
DYN-FASE-COR	Dynamic phase correction
EHT	Extra High Tension
EHT-INFO	Extra High Tension information
ELDP	Electrical Local Doming Prevention (only HW)
EPG	Electronic Program Guide: system used by broadcasters to transmit TV guide information (= NexTView)
EW	East West, related to horizontal deflection of the set
EXT	External (source), entering the set via SCART or via cinches
FBL	Fast Blanking: DC signal accompanying RGB signals
FBL-SC1-IN	Fast blanking signal for SCART1 in
FBL-SC2-IN	Fast blanking signal for SCART2 in
FBL-TXT	Fast Blanking Teletext
FBX	Feature Box: part of small signal / separate module which contains 100 Hz processing, extra featuring and AutoTV algorithms
FEAT-U	U from Feature Box
FEAT-V	V from Feature Box
FEAT-Y	Y from Feature Box
FILAMENT	Filament of CRT
FLASH	Flash memory
FM	Field Memory or Frequency Modulation
FMS	Functional Module Specification: document that describes an isolated hardware function
FRONT-C	Front input chrominance (SVHS)
FRONT-DETECT	Front input detection
FRONT-Y_CVBS	Front input luminance or CVBS (SVHS)
FRS	Functional Requirement Specification: software specification document
G-SC1-IN	Green SCART1 in
G-SC2-IN	Green SCART2 in
G-TXT	Green teletext
HA	Horizontal Acquisition: horizontal sync pulse coming out of the HIP
HD100	Horizontal Drive: horizontal sync pulse coming out of the featurebox
HDTV	High Definition TV: highest resolution defined by the ATSC standard (1080 lines and 1920 horizontal pixels, referred to as 1080i) The second HDTV standard, 720p x 1280 is not used in EM2E chassis (3fH standard not feasible)
Headroom	Extra margin provision to avoid clipping of signals
HEATER	Heater (Filament)
HFB	Horizontal Flyback Pulse: horizontal sync pulse from large signal deflection
HFB+13V	Non rectified output 13V-winding LOT
HIP	High-end video Input Processor: video and chroma decoder of EM2E
HOP	High-end video Output Processor: video, sync and geometry controller of EM2E
HP	Headphone
HSI	Hardware Software Interface

IN-FRONT-SNDL	Sound left front in
IN-FRONT-SNDR	Sound right front in
IN-SC1-B	In SCART1 Blue
IN-SC1-G	In SCART1 Green
IN-SC1-R	In SCART1 Red
IN-SC1-SNDL	In SCART1 sound left
IN-SC1-SNDR	In SCART1 sound right
IN-SC2-B	In SCART2 Blue
IN-SC2-CVBS_Y	In SCART2 CVBS or luminance (SVHS)
IN-SC2-FBL	In SCART2 fast blanking
IN-SC2-G	In SCART2 Green
Interlaced	Scan mode where two fields are used to form one frame. Each field contains half the number of the total amount of lines. The fields are written in “pairs”, causing line flicker.
IO-BUS	In/Out - Bus
Last Status	The settings last chosen by the customer and read and stored in RAM or in the NVM. They are called at start-up of the set to configure it according the customers wishes
LDP	Line Deflection Protection
LED	Light Emitting Diode
LINE-DRIVE	Line drive signal
LNA	Low Noise Adapter
LSP	Large signal panel
MSP	Multistandard Sound Processor: ITT sound decoder of EM2E
MUTE	Mute-Line
NC	Not Connected
NDF	No vertical DeFlection: vertical flyback protection
NHF	No Horizontal deflection: horizontal flyback protection
NVM	Non Volatile Memory: IC containing TV related data e.g. alignments
O/C	Open Circuit
ON/OFF LED	On/Off control signal for the LED
OSD	On Screen Display
OTC	On screen display Teletext and Control; also named Artistic (SAA5800)
P50	Project 50 communication: protocol between TV and peripherals
PCB	Printed Circuit board
PICNIC	Peripheral Integrated Combined Network IC: main IC for 100 Hz featuring and feature processing
PILOT	Pilot Signal
PILOTMUTE	Pilot Mute signal
Progressive Scan	Scan mode where all scan lines are displayed in one frame at the same time, creating a double vertical resolution.
PTP	Picture Tube Panel
RAM	Random Access Memory
RC	Remote Control
RC5	RC5 signal from the remote control receiver
RESET	Reset signal
ROM	Read Only Memory
SAM	Service Alignment Mode
SC	Sandcastle: pulse derived from sync signals
SCAVEM	Scan Velocity Modulation
S/C	Short Circuit
SC1-OUT	SCART output of the MSP audio IC
SC2-B-IN	Scart2 Blue in
SC2-C-IN	Scart2 chrominance in
SC2-OUT	SCART output of the MSP audio IC
SIF	Sound Intermediate Frequency
SIMM	80-fold connector between LSP and SSB
SLDP	Smart Local Dooming Prevention (HW and SW)
SNDL-SC1-IN	Sound left SCART1 in
SNDL-SC1-OUT	Sound left SCART1 out
SNDL-SC2-IN	Sound left SCART2 in
SNDL-SC2-OUT	Sound left SCART2 out
SNDR-SC1-IN	Sound right SCART1 in
SNDR-SC1-OUT	Sound right SCART1 out
SNDR-SC2-IN	Sound right SCART2 out
SNDR-SC2-OUT	Sound right SCART2 out
SNDS-VL-OUT	Surround sound left variable level out
SNDS-VR-OUT	Surround sound right variable level out
SNERT	Synchronous No parity Eight bit Reception and Transmit
SSB	Small Signal Board
STBY	Standby
SW	Subwoofer
TXT	Teletext
TXT DS	Teletext Dual Screen
µP	microprocessor
VA	Vertical Acquisition
V_{BAT}	main supply for deflection (mostly 141 V)
VD100	Vertical Drive: vertical sync pulse from deflection
VFB	Vertical Flyback Pulse: vertical sync pulse coming from the feature box
VL	Variable Level out: processed audio output towards external amplifier
WYSIWYR	What You See Is What You Record: record selection that follows main picture and sound
XTAL	Quartz crystal
Y-OUT	Luminance-signal to HOP IC

10. Spare parts list

Large Signal Panel [A]

Various

0010	2422 025 16374	2P Male
0020	4822 267 10774	2P Male
0032	4822 492 70788	IC-SPRING
0037	3104 304 21112	LOT SSB SUPPORT
0045	4822 267 10734	5P MALE
0065	3104 304 22031	LOT SPACER
0066	3104 304 21591	SCART SUPPORT BRACKET
0150	4822 265 11253	FUSE HOLDER
0153	4822 265 11253	FUSE HOLDER
0317	4822 265 20723	2P MALE
0324	3104 311 01881	CABLE 7P 480mm
0325	2422 025 16382	3P Male
0735	2422 025 16407	3P Male
0736	2422 025 16382	3P Male
0936	2422 025 12485	11P Male
0940	4822 267 10968	11P FEMALE
0943	4822 267 10748	3P MALE
0945	4822 267 10735	3P MALE
0946	5322 268 90415	2P MALE
0947	4822 267 10734	5P MALE
1001	4822 252 60151	SURGE PROTECT
1002	2422 132 07411	RELAY 1P 5V 5A
1003	4822 267 10973	1P
1200	4822 210 10848	UV1316/A I U-2
1205	2422 025 16599	80P Female SIMM
1501	4822 070 34002	FUSE 4A
1503	2422 086 10912	FUSE 2,5A
1901	4822 267 10771	IC SOCKET 42P
1902	4822 267 10982	2P
8000	4822 320 12525	CABLE
8001	4822 320 20234	EHT CABLE
8015	4822 320 20216	CABLE
	3122 785 100	Supply Kit Mains Supply EM2E
	3122 785 100	Supply Kit Standby Supply EM2E
	3122 785 100	Line Repair Kit EM2E

⊣⊢

2101	5322 122 32818	2.2nF 10% 100V
2102	4822 124 40248	10µF 20% 63V
2103	5322 122 32531	100pF 5% 50V
2104	4822 123 14025	2200µF 20% 16V
2105	5322 122 32531	100pF 5% 50V
2106	5322 126 10223	4.7nF 10% 63V
2107	5322 122 32818	2.2nF 10% 100V
2108	4822 121 70162	10nF 5% 400V
2109	4822 126 13482	470nF 80/20% 16V
2110	5322 121 42498	680nF 5% 63V
2111	4822 121 43526	47nF 5% 250V
2113	4822 122 33127	2.2nF 10% 63V
2114	4822 126 10206	2.2nF 10% 500V
2200	4822 124 40196	220µF 20% 16V
2201	4822 126 14076	220nF 25V
2202	4822 126 13473	220nF 80-20% 50V
2203	4822 124 41584	100µF 20% 10V
2400	4822 124 11575	47µF 20% 160V
2412	4822 126 13751	47nF 10% 63V
2413	4822 124 12255	10µF 20% 50V
2414	4822 126 13751	47nF 10% 63V
2415	4822 122 33575	220pF 5% 63V
2417	4822 126 14076	220nF 25V
2419	4822 126 14237	470pF 10% 2KV
2420	4822 121 70594	1nF 5% 2KV
2421	2022 333 00086	470nF 5% 250V
2421	4822 121 42634	560nF 5% 250V
2425	4822 121 10526	9N1 5% 2KV
2425	4822 121 70435	10nF 5% 2KV
2426	4822 121 10653	22nF 5% 630V
2426	4822 121 10658	24nF 5% 630V
2429	4822 121 43343	4.7nF 10% 400V
2430	4822 121 41857	10nF 5% 250V
2431	4822 121 42077	6.8nF 10% 400V
2431	4822 126 13599	3.3nF 10% 500V
2433	2022 333 00086	470nF 5% 250V
2433	4822 121 42634	560nF 5% 250V
2435	4822 121 10526	9N1 5% 2KV
2450	5322 121 42578	100nF 5% 250V
2455	5322 126 10511	1nF 5% 50V
2460	4822 124 40784	3300µF 20% 16V
2461	4822 122 31177	470pF 10% 500V
2462	4822 124 80061	1000µF 20% 25V
2463	4822 122 31177	470pF 10% 500V
2464	4822 124 80061	1000µF 20% 25V
2465	4822 122 31177	470pF 10% 500V
2468	4822 124 12297	4.7µF 20% 350V
2469	4822 122 31177	470pF 10% 500V
2480	4822 121 51442	2.2nF 10% 50V
2489	4822 124 40433	47µF 20% 25V
2490	4822 122 33891	3.3nF 10% 63V
2491	4822 124 40768	0.47µF 20% 100V
2492	4822 126 14076	220nF 25V
2495	4822 126 13838	100nF 20% 50V
2499	4822 126 13838	100nF 20% 50V
2501	4822 126 11524	1.5nF 10% 1KV
2502	5322 122 32818	2.2nF 10% 100V
2503	5322 121 42489	33nF 5% 250V
2505	4822 126 14504	3.3nF 20% 250V
2507	4822 126 13589	470nF 275V
2508	4822 126 14153	2.2nF 10%B 1KV
2509	4822 126 14153	2.2nF 10%B 1KV
2510	4822 124 12415	220µF 20% 400V
2512	4822 124 12056	1000µF 20% 35V
2513	5322 122 34099	470pF 10% 63V
2514	5322 122 31863	63V 330pF 5%
2515	4822 124 11575	47µF 20% 160V
2518	4822 126 11308	47pF 5% 500V
2519	5322 122 32818	2.2nF 10% 100V
2520	4822 126 14585	100nF 10% 50V
2521	4822 122 33216	270pF 5% 50V
2528	4822 126 14585	100nF 10% 50V
2530	4822 126 14585	100nF 10% 50V
2531	4822 122 31169	1.5nF 10% 500V
2535	4822 121 43913	470nF 10% 100V
2536	4822 126 10206	2.2nF 10% 500V
2537	4822 124 11913	22nF 20% 275V
2538	5322 126 10223	4.7nF 10% 63V
2600	4822 121 43913	470nF 10% 100V
2601	4822 121 51252	470nF 5% 63V
2602	4822 124 40433	47µF 20% 25V
2603	4822 122 33177	10nF 20% 50V
2604	4822 124 40248	10µF 20% 63V
2610	4822 122 33127	2.2nF 10% 63V
2620	4822 126 14076	220nF 25V
2621	4822 126 13838	100nF 20% 50V
2622	4822 124 40255	100µF 20% 63V
2624	4822 121 51252	470nF 5% 63V
2625	4822 121 51252	470nF 5% 63V
2627	5322 124 40641	10µF 20% 100V
2642	4822 124 40255	100µF 20% 63V
2700	4822 124 21913	1µF 20% 63V
2701	4822 124 21913	1µF 20% 63V
2730	4822 124 81151	22µF 50V
2731	4822 124 81151	22µF 50V
2732	4822 124 40255	100µF 20% 63V
2733	4822 124 40255	100µF 20% 63V
2734	4822 124 81151	22µF 50V
2735	4822 124 81151	22µF 50V
2736	5322 122 31865	1.5nF 10% 63V
2737	5322 122 31865	1.5nF 10% 63V
2756	4822 126 13751	47nF 10% 63V
2760	4822 124 80061	1000µF 20% 25V
2761	4822 124 80061	1000µF 20% 25V
2765	4822 124 40255	100µF 20% 63V
2767	4822 124 40255	100µF 20% 63V
2782	4822 126 13751	47nF 10% 63V
2902	5322 122 31863	330pF 5% 63V
2903	5322 122 31863	330pF 5% 63V
2906	5322 122 32531	100pF 5% 50V
2909	5322 122 31863	330pF 5% 63V
2910	5322 122 32531	100pF 5% 50V
2912	4822 124 40248	10µF 20% 63V
2913	4822 126 14585	100nF 10% 50V
2915	5322 122 31863	330pF 5% 63V
2916	5322 122 31863	330pF 5% 63V
2917	5322 122 32531	100pF 5% 50V
2919	5322 122 31863	330pF 5% 63V
2920	5322 122 32531	100pF 5% 50V
2923	5322 122 31863	330pF 5% 63V
2925	5322 122 31863	330pF 5% 63V
2926	4822 124 81044	470µF 20% 6.3V
2927	4822 124 40433	47µF 20% 25V
2941	5322 122 31865	1.5nF 10% 63V
2942	5322 122 31865	1.5nF 10% 63V
2951	4822 124 21913	1µF 20% 63V
2952	4822 126 13751	47nF 10% 63V
2953	4822 126 13751	47nF 10% 63V

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3101	4822 053 20106	10M 5% 0.25W
3102	4822 050 26801	680Ω 1% 0.6W
3103	4822 050 26801	680Ω 1% 0.6W
3104	4822 116 52195	47Ω 5% 0.5W
3105	4822 050 26801	680Ω 1% 0.6W
3106	4822 116 52256	2k2 5% 0.5W
3107	4822 116 52256	2k2 5% 0.5W
3108	4822 116 52182	15Ω 5% 0.5W
3110	4822 052 10109	10Ω 5% 0.33W
3113	4822 116 52182	15Ω 5% 0.5W
3114	4822 116 83872	220Ω 5% 0.5W
3117	4822 116 52195	47Ω 5% 0.5W
3118	4822 050 24708	4Ω7 1% 0.6W
3120	4822 051 20109	10Ω 5% 0.1W
3123	4822 116 52176	10Ω 5% 0.5W
3124	4822 116 52199	68Ω 5% 0.5W
3125	4822 116 52182	15Ω 5% 0.5W
3126	4822 050 21003	10k 1% 0.6W
3127	4822 116 52289	5k6 5% 0.5W
3200	4822 051 20101	100Ω 5% 0.1W
3201	4822 051 20101	100Ω 5% 0.1W
3250	4822 051 20223	22k 5% 0.1W
3402	4822 117 10837	100k 1% 0.1W
3403	4822 051 20101	100Ω 5% 0.1W
3404	4822 051 20471	470Ω 5% 0.1W
3406	4822 051 20101	100Ω 5% 0.1W
3407	4822 117 10833	10k 1% 0.1W
3410	4822 051 20479	47Ω 5% 0.1W
3411	4822 116 52193	39Ω 5% 0.5W
3414	4822 117 13577	330Ω 1% 1.25W
3415	3198 012 31590	15Ω 5% 3W
3415	4822 117 12836	12Ω 5% 3W
3417	4822 116 52176	10Ω 5% 0.5W
3418	4822 050 22704	270k 1% 0.6W
3431	4822 052 10101	100Ω 5% 0.33W
3431	4822 052 10221	220Ω 5% 0.33W
3450	4822 116 52303	8k2 5% 0.5W
3450	4822 116 83961	6k8 5%
3451	4822 116 52257	22k 5% 0.5W
3460	4822 052 10108	1Ω 5% 0.33W
3461	4822 052 10108	1Ω 5% 0.33W
3462	4822 052 10108	1Ω 5% 0.33W
3463	4822 052 10108	1Ω 5% 0.33W
3464	4822 052 10108	1Ω 5% 0.33W
3465	4822 052 10108	1Ω 5% 0.33W
3466	4822 052 10688	6Ω8 5% 0.33W
3466	4822 052 10828	8Ω2 5% 0.33W
3467	4822 052 10108	1Ω 5% 0.33W
3468	4822 052 11688	6Ω8 5% 0.5W
3475	4822 116 52175	100Ω 5% 0.5W
3481	4822 116 52175	100Ω 5% 0.5W
3483	4822 051 10102	1k 2% 0.25W
3484	4822 117 11139	1k5 1% 0.1W
3485	4822 117 11454	820Ω 1% 0.1W
3486	4822 117 12955	2k7 1% 0.1W
3487	4822 117 11449	2k2 1% 0.1W
3488	4822 116 52272	330k 5% 0.5W
3488	4822 116 83874	220k 5% 0.5W
3489	4822 117 11449	2k2 1% 0.1W
3491	4822 050 21504	150k 1% 0.6W
3495	4822 051 20683	68k 5% 0.1W
3496	4822 117 11507	6k8 1% 0.1W
3497	4822 117 10834	47k 1% 0.1W
3498	4822 051 20472	4k7 5% 0.1W
3499	4822 117 10837	100k 1% 0.1W
3500	4822 117 12074	1Ω5 10% 7W
3501	3198 013 04710	470Ω 2% 1/2W
3504	4822 116 83883	470Ω 5% 0.5W
3507	4822 050 21604	160k 1% 0.6W
3508	3198 012 16820	6.8k 1W
3509	2322 595 90021	VDR DC 1M A/495V
3510	4822 117 11951	2k 1% 0.1W
3511	4822 116 52276	3k9 5% 0.5W
3512	4822 116 52297	68k 5% 0.5W
3513	4822 116 52272	330k 5% 0.5W
3514	4822 053 10108	1Ω 5% 1W
3515	4822 053 10108	1Ω 5% 1W
3516	4822 116 10075	9Ω 220V
3518	4822 050 11204	120k 1% 0.4W
3519	4822 051 20223	22k 5% 0.1W
3520	4822 053 11333	33k 5% 2W

3521	4822 117 10118	1M 5% 0.5W
3522	4822 116 83961	6k8 5%
3523	4822 051 20105	1M 5% 0.1W
3524	4822 051 10102	1k 2% 0.25W
3525	4822 051 20479	47Ω 5% 0.1W
3526	4822 116 83303	1Ω 2W
3527	4822 117 11454	820Ω 1% 0.1W
3528	4822 117 10833	10k 1% 0.1W
3529	4822 051 20472	4k7 5% 0.1W
3530	4822 116 52297	68k 5% 0.5W
3531	4822 117 10833	10k 1% 0.1W
3533	4822 051 20159	15Ω 5% 0.1W
3535	4822 051 20273	27k 5% 0.1W
3536	4822 117 10837	100k 1% 0.1W
3537	4822 117 10833	10k 1% 0.1W
3538	4822 051 20332	3k3 5% 0.1W
3539	4822 117 10833	10k 1% 0.1W
3540	4822 117 10834	47k 1% 0.1W
3541	4822 117 10833	10k 1% 0.1W
3542	3198 012 11570	0Ω15 5% 1W
3543	4822 051 20478	4Ω7 5% 0.1W
3544	4822 051 20479	47Ω 5% 0.1W
3600	4822 050 22205	2M2 1% 0.6W
3601	4822 050 22205	2M2 1% 0.6W
3602	4822 051 20332	3k3 5% 0.1W
3603	4822 101 11319	100Ω LIN
3605	4822 051 20273	27k 5% 0.1W
3606	4822 051 10102	1k 2% 0.25W
3607	4822 051 20223	22k 5% 0.1W
3608	4822 051 20223	22k 5% 0.1W
3609	4822 101 11193	47k 30% LIN 0.1W
3610	4822 051 20683	68k 5% 0.1W
3611	4822 051 20822	8k2 5% 0.1W
3612	4822 051 20274	270k 5% 0.1W
3613	4822 051 20274	270k 5% 0.1W
3614	4822 050 21005	1M 1% 0.6W
3615	4822 050 18204	820k 1% 0.4W
3615	4822 116 52292	560k 5% 0.5W
3616	4822 116 52285	470k 5% 0.5W
3617	4822 050 11002	1k 1% 0.4W
3618	4822 051 10102	1k 2% 0.25W
3619	4822 051 20562	5k6 5% 0.1W
3620	4822 116 80176	1Ω 5% 0.5W
3620	4822 116 80676	1Ω5 5% 0.5W
3621	4822 116 80176	1Ω 5% 0.5W
3622	4822 116 80176	1Ω 5% 0.5W
3623	4822 117 10834	47k 1% 0.1W
3624	4822 052 10158	1Ω5 5% 0.33W
3625	4822 116 83872	220Ω 5% 0.5W
3626	4822 116 83872	220Ω 5% 0.5W
3627	4822 050 21003	10k 1% 0.6W
3630	4822 051 10102	1k 2% 0.25W
3631	4822 051 20332	3k3 5% 0.1W
3632	4822 117 10833	10k 1% 0.1W
3633	4822 050 21003	10k 1% 0.6W
3644	4822 117 10833	10k 1% 0.1W
3645	4822 116 52245	150k 5% 0.5W
3652	4822 051 20101	100Ω 5% 0.1W
3701	4822 117 10833	10k 1% 0.1W
3702	4822 117 10833	10k 1% 0.1W
3730	4822 117 10833	10k 1% 0.1W
3731	4822 117 10833	10k 1% 0.1W
3732	4822 051 20822	8k2 5% 0.1W
3733	4822 051 20822	8k2 5% 0.1W
3734	4822 117 10834	47k 1% 0.1W
3735	4822 117 10834	47k 1% 0.1W
3736	4822 051 10102	1k 2% 0.25W
3737	4822 051 10102	1k 2% 0.25W
3738	4822 117 11148	56k 1% 0.1W
3739	4822 117 11148	56k 1% 0.1W
3740	4822 051 20683	68k 5% 0.1W
3741	4822 051 20683	68k 5% 0.1W
3742	4822 116 52199	68Ω 5% 0.5W
3743	4822 116 52199	68Ω 5% 0.5W
3756	4822 117 10833	10k 1% 0.1W
3762	4822 051 20828	8Ω2 5% 0.1W
3765	4822 117 11507	6k8 1% 0.1W
3770	4822 117 10834	47k 1% 0.1W
3771	4822 116 83933	15k 1% 0.1W
3773	4822 116 83933	15k 1% 0.1W
3789	4822 051 20828	8Ω2 5% 0.1W
3790	4822 051 10102	1k 2% 0.25W
3792	4822 051 10102	1k 2% 0.25W
3900	4822 116 83868	150Ω 5% 0.5W
3901	4822 117 10353	150Ω 1% 0.1W
3902	4822 117 10353	150Ω 1% 0.1W
3903	4822 117 10353	150Ω 1% 0.1W
3905	4822 116 83883	470Ω 5% 0.5W
3906	4822 116 52201	75Ω 5% 0.5W
3907	4822 051 20561	560Ω 5% 0.1W
3908	4822 116 52201	75Ω 5% 0.5W
3909	4822 116 52201	75Ω 5% 0.5W
3910	4822 116 52201	75Ω 5% 0.5W
3911	4822 116 52201	75Ω 5% 0.5W
3913	4822 116 52201	75Ω 5% 0.5W
3915	4822 116 52201	75Ω 5% 0.5W
3916	4822 051 20822	8k2 5% 0.1W
3918	4822 051 20392	3k9 5% 0.1W
3919	4822 051 10102	1k 2% 0.25W
3920	4822 051 10102	1k 2% 0.25W
3921	4822 117 10353	150Ω 1% 0.1W
3922	4822 117 10353	150Ω 1% 0.1W
3923	4822 117 10353	150Ω 1% 0.1W
3924	4822 117 10353	150Ω 1% 0.1W
3925	4822 052 10688	6Ω8 5% 0.33W
3928	4822 051 20101	100Ω 5% 0.1W
3929	4822 117 10833	10k 1% 0.1W
3930	4822 051 20561	560Ω 5% 0.1W
3932	4822 116 52201	75Ω 5% 0.5W
3935	4822 116 52201	75Ω 5% 0.5W
3936	4822 117 10353	150Ω 1% 0.1W
3937	4822 117 10353	150Ω 1% 0.1W
3940	4822 117 10353	150Ω 1% 0.1W
3941	4822 117 10353	150Ω 1% 0.1W
3942	4822 051 20822	8k2 5% 0.1W
3944	4822 051 10102	1k 2% 0.25W
3945	4822 051 20392	3k9 5% 0.1W
3946	4822 051 10102	1k 2% 0.25W
3970	4822 051 20471	470Ω 5% 0.1W
3971	4822 117 10833	10k 1% 0.1W
3972	4822 117 10833	10k 1% 0.1W
3991	4822 116 52175	100Ω 5% 0.5W
3992	4822 051 20101	100Ω 5% 0.1W
3993	4822 051 20101	100Ω 5% 0.1W
3994	4822 116 52175	100Ω 5% 0.5W
3995	4822 116 52175	100Ω 5% 0.5W
3996	4822 116 52175	100Ω 5% 0.5W
3997	4822 116 52175	100Ω 5% 0.5W
3998	4822 116 52175	100Ω 5% 0.5W
4xxx	4822 051 10008	0Ω 5% 0.25W
4xxx	4822 051 20008	0Ω 5% 0.25W
9220	4822 051 20008	JUMPER
9225	4822 051 20008	JUMPER
9723	4822 051 20008	JUMPER
9724	4822 051 20008	JUMPER

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5101	4822 146 11065	STANDBY TFM
5102	4822 157 70436	8.2µH
5103	4822 526 10704	BEAD 50MHz
5104	4822 157 11411	BEAD 100MHz
5105	4822 526 10704	BEAD 100MHz
5200	4822 157 11775	6.8µH 5%
5400	4822 157 11869	33µH 10%
5410	4822 146 11065	TFM SIG FIX
5411	4822 157 71097	0.56µH
5421	4822 157 11204	COIL LINE CORR.(29")
5421	4822 157 11839	COIL LINE CORR. (28")
5421	4822 157 11841	COIL LINE CORR. (28"WS,32"WS)
5422	4822 157 71535	COIL BRIDGE
5424	4822 157 63255	COIL BRIDGE
5430	8204 000 73321	LOT (29")
5430	8228 001 33243	LOT (25",28")
5461	4822 157 11411	BEAD 100MHz
5463	4822 157 11411	BEAD 100MHz
5465	4822 157 11411	BEAD 100MHz
5466	4822 157 71467	39U 10%
5467	4822 157 11411	BEAD 100MHz
5504	2422 549 43286	MAINS 35mH 1A5
5505	4822 157 11411	BEAD 100MHz
5506	2422 531 98042	TFM W8085-002 Y
5510	4822 157 11411	BEAD 100MHz
5620	4822 157 11771	0.09µH 10%

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6103	4822 130 42488	BYD33D
6105	4822 130 34281	BZX79-B15
6106	4822 130 34499	BZX79-B20
6108	4822 130 30621	1N4148
6109	4822 130 31083	BYW55
6111	4822 130 32715	SB340
6120	4822 130 30621	1N4148
6121	4822 130 30621	1N4148
6122	3198 010 53980	BZX79-B3V9
6200	9322 149 10685	BZM55-C33
6201	4822 130 83757	BAS216
6202	4822 130 83757	BAS216
6203	4822 130 10852	BZX284-C6V8
6204	4822 130 10852	BZX284-C6V8
6205	4822 130 83757	BAS216
6405	4822 130 11027	BZX284-C33
6406	4822 130 83757	BAS216
6407	4822 130 83757	BAS216
6408	4822 130 42488	BYD33D
6421	4822 130 10753	BY359X-1500
6422	4822 130 10218	BY229X-800
6442	9322 129 42685	BZM55-C15
6461	4822 130 82512	BYV29F-400
6462	4822 130 41487	BYV95C
6464	5322 130 31938	BYV27-200
6468	4822 130 42488	BYD33D
6480	4822 130 42488	BYD33D
6481	4822 130 31024	BZX79-B18
6482	4822 130 83757	BAS216
6499	4822 130 83757	BAS216
6501	4822 130 31083	BYW55
6502	4822 130 31083	BYW55
6503	4822 130 31083	BYW55
6504	4822 130 31083	BYW55
6505	4822 130 34281	BZX79-B15
6506	4822 130 30621	1N4148
6507	4822 130 80791	BYV28-200/20
6508	4822 130 11415	BYV28-400/20
6510	4822 130 34281	BZX79-B15
6511	4822 130 83757	BAS216
6512	4822 130 83757	BAS216
6514	5322 130 31932	BZT03-C200
6515	4822 130 32904	BZV85-C5V6
6516	4822 130 83757	BAS216
6517	4822 130 31983	BAT85
6518	4822 130 83757	BAS216
6520	4822 130 42488	BYD33D
6521	4822 130 83757	BAS216
6522	4822 130 83757	BAS216
6600	4822 130 31983	BAT85
6616	4822 130 83757	BAS216
6619	4822 130 42488	BYD33D
6620	5322 130 31938	BYV27-200
6621	4822 130 42488	BYD33D
6622	5322 130 33635	BZV85-C8V2
6623	4822 130 83757	BAS216

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7100	4822 130 44568	BC557B
7101	4822 130 40959	BC547B
7102	4822 130 11417	STP3NB60FP
7104	4822 130 11418	TCDT1102G
7407	4822 130 60511	BC847B
7408	9332 592 40126	BC368
7409	4822 130 60511	BC847B
7421	4822 130 63666	BU2520DF
7480	4822 130 11417	STP3NB60FP
7481	4822 130 44568	BC557B
7482	4822 130 11418	TCDT1102G
7499	4822 130 60373	BC856B
7502	4822 130 61675	BF487
7504	9322 126 65687	STP5NB60FP
7505	4822 130 60373	BC856B
7506	4822 209 81397	TL431CLPST
7510	4822 130 60511	BC847B
7511	4822 130 60373	BC856B
7528	4822 130 40981	BC337-25
7529	4822 130 60511	BC847B
7600	4822 130 44461	BC546B
7602	4822 130 60511	BC847B
7603	4822 130 60373	BC856B
7605	4822 130 60511	BC847B
7606	4822 130 60511	BC847B
7610	4822 130 11418	TCDT1102G
7620	4822 209 90009	TDA8177
7641	4822 130 60511	BC847B
7652	4822 130 60511	BC847B
7720	4822 130 60511	BC847B
7721	4822 130 60511	BC847B
7722	4822 130 60373	BC856B
7723	4822 130 60373	BC856B
7724	4822 130 60511	BC847B
7725	4822 130 60511	BC847B
7730	4822 130 60511	BC847B
7750	4822 209 32269	TDA2616/N1
7900	4822 130 40959	BC547B
7901	4822 130 40959	BC547B
7905	9332 592 40126	BC368
7906	4822 209 12334	L4940V85
7907	4822 130 60511	BC847B

Small Signal Panel [B]

Various

1001	2422 543 89022	RES XTL 6M000
1301	2422 540 98456	RES 12MHz
1305	2422 543 01092	RES XTL 4M433619
1308	2422 543 01097	RES XTL 3M579545
1405	2422 549 44369	FIL SAW 38MHz
1407	2422 549 44324	FIL TPWCC04BS
1408	2422 549 44372	FIL SAW 38MHz
1409	2422 025 16542	2P MALE
1651	2422 543 89019	RES XTL 8M432
1701	2422 543 89018	RES XTL 12MHz

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2001	4822 126 11671	33pF
2002	4822 126 11669	27pF
2003	4822 126 13879	220nF 20% 16V
2004	4822 126 13879	220nF 20% 16V
2005	4822 126 14305	100nF 10% 16V
2006	4822 126 14305	100nF 10% 16V
2007	4822 126 14305	100nF 10% 16V
2008	4822 126 14305	100nF 10% 16V
2009	4822 122 33777	47pF 5% 63V
2010	4822 122 33777	47pF 5% 63V
2011	4822 122 33777	47pF 5% 63V
2012	4822 122 33777	47pF 5% 63V
2013	4822 124 12095	100µF 20% 16V
2014	4822 126 14305	100nF 10% 16V
2015	4822 126 14305	100nF 10% 16V
2016	4822 124 12095	100µF 20% 16V
2017	4822 126 14305	100nF 10% 16V
2019	4822 126 14305	100nF 10% 16V
2020	4822 126 13883	220pF 5% 50V
2022	4822 126 14305	100nF 10% 16V
2023	4822 126 14305	100nF 10% 16V
2024	4822 126 14305	100nF 10% 16V
2025	4822 126 14305	100nF 10% 16V
2026	4822 126 14305	100nF 10% 16V
2027	4822 126 14305	100nF 10% 16V
2028	4822 126 14305	100nF 10% 16V
2029	4822 126 14305	100nF 10% 16V
2031	4822 126 14305	100nF 10% 16V
2032	4822 126 14305	100nF 10% 16V
2033	4822 126 14226	82pF 5% 50V
2034	4822 126 14226	82pF 5% 50V
2035	4822 126 14226	82pF 5% 50V
2036	4822 126 14226	82pF 5% 50V
2037	4822 126 14226	82pF 5% 50V
2038	4822 126 14305	100nF 10% 16V
2300	4822 124 12095	100µF 20% 16V
2303	5322 126 11583	10nF 10% 50V
2304	4822 122 33741	10pF 10% 50V
2306	4822 126 13881	470pF 5% 50V
2307	4822 126 14305	100nF 10% 16V
2308	4822 122 33741	10pF 10% 50V
2313	4822 121 70159	0.1µF 16V
2314	4822 124 12095	100µF 20% 16V
2315	4822 126 14305	100nF 10% 16V
2317	4822 126 14491	2.2µF 10V
2318	4822 126 14494	22nF 10% 25V
2319	5322 126 11583	10nF 10% 50V
2320	4822 122 33741	10pF 10% 50V
2321	4822 126 14305	100nF 10% 16V
2322	4822 126 14305	100nF 10% 16V
2323	4822 126 14305	100nF 10% 16V
2324	5322 126 11583	10nF 10% 50V
2325	4822 126 14305	100nF 10% 16V
2328	4822 122 33761	22pF 5% 50V
2329	4822 126 14305	100nF 10% 16V
2330	4822 126 14305	100nF 10% 16V
2331	4822 126 14305	100nF 10% 16V
2332	4822 126 14305	100nF 10% 16V
2333	4822 126 14491	2.2µF 10V
2334	4822 126 14491	2.2µF 10V
2335	4822 124 80349	47µF 20% 6.3V
2336	4822 126 14491	2.2µF 10V
2338	5322 126 11583	10nF 10% 50V
2340	4822 124 23002	10µF 16V
2341	4822 124 12095	100µF 20% 16V
2350	4822 126 14305	100nF 10% 16V
2351	4822 126 14305	100nF 10% 16V
2352	4822 126 14305	100nF 10% 16V
2356	4822 126 14305	100nF 10% 16V
2357	4822 126 14305	100nF 10% 16V
2358	5322 126 11579	3.3nF 10% 63V
2359	4822 122 33752	15pF 5% 50V
2361	3198 016 31580	1P5 50V
2362	4822 126 11663	12pF
2365	4822 126 14305	100nF 10% 16V
2366	4822 126 14305	100nF 10% 16V
2367	4822 126 14305	100nF 10% 16V
2368	4822 126 14305	100nF 10% 16V
2369	4822 126 14305	100nF 10% 16V
2370	4822 126 14305	100nF 10% 16V
2371	4822 126 13193	4.7nF 10% 63V
2372	4822 126 14043	1µF 20% 16V
2373	4822 126 14305	100nF 10% 16V
2374	4822 126 14491	2.2µF 10V
2375	4822 126 14494	22nF 10% 25V
2376	4822 126 14305	100nF 10% 16V
2377	4822 124 12095	100µF 20% 16V
2378	4822 126 14305	100nF 10% 16V
2384	4822 126 14305	100nF 10% 16V
2406	4822 126 13883	220pF 5% 50V
2407	4822 126 13956	68pF 5% 63V
2408	3198 016 32780	2P7 50V
2409	4822 126 14491	2.2µF 10V
2410	4822 126 14472	1µF 10% 10V
2411	4822 126 14305	100nF 10% 16V
2412	4822 126 13193	4.7nF 10% 63V
2413	4822 124 80151	47µF 16V
2417	3198 017 44740	470nF 10V
2418	4822 126 13956	68pF 5% 63V
2420	4822 122 33753	150pF 5% 50V
2501	4822 122 33777	47pF 5% 63V
2502	4822 122 32927	220nF 20% 50V
2503	4822 122 32927	220nF 20% 50V
2504	4822 122 32927	220nF 20% 50V
2505	4822 122 32927	220nF 20% 50V
2508	4822 124 12095	100µF 20% 16V
2546	4822 124 23002	10µF 16V
2547	4822 124 23002	10µF 16V
2548	4822 124 23002	10µF 16V
2549	4822 124 23002	10µF 16V
2550	4822 126 14241	330P 50V
2551	5322 126 11579	3.3nF 10% 63V
2609	3198 016 31020	0603 25V 1nF
2610	4822 126 14238	2N2 50V
2611	5322 126 11578	1nF 10% 50V
2629	4822 122 32927	220nF 20% 50V
2636	4822 122 32927	220nF 20% 50V
2637	4822 122 32927	220nF 20% 50V
2638	4822 122 32927	220nF 20% 50V
2640	4822 126 13879	220nF 20% 16V
2641	4822 122 32927	220nF 20% 50V
2642	4822 122 32927	220nF 20% 50V
2651	4822 126 14305	100nF 10% 16V
2652	4822 122 33777	47pF 5% 63V
2653	4822 122 32927	220nF 20% 50V
2654	4822 126 13881	470pF 5% 50V
2655	4822 126 13881	470pF 5% 50V
2656	4822 126 13881	470pF 5% 50V
2657	4822 126 13881	470pF 5% 50V
2658	4822 126 13881	470pF 5% 50V
2661	4822 122 32927	220nF 20% 50V
2662	4822 122 32927	220nF 20% 50V
2663	4822 126 13881	470pF 5% 50V
2664	4822 126 13881	470pF 5% 50V
2665	4822 124 12095	100µF 20% 16V
2666	4822 124 12095	100µF 20% 16V
2667	3198 016 33380	3P3 50V
2668	3198 016 33380	3P3 50V
2669	4822 124 23002	10µF 16V
2670	5322 126 11583	10nF 10% 50V
2673	3198 016 31020	1nF 25V
2674	3198 016 31020	1nF 25V
2675	4822 124 23002	10µF 16V
2677	3198 030 82280	2U2 20% 50V
2677	4822 124 23002	10µF 16V
2678	4822 124 23002	10µF 16V
2679	4822 126 14305	100nF 10% 16V
2680	4822 124 23002	10µF 16V
2681	4822 126 14305	100nF 10% 16V
2682	4822 124 23002	10µF 16V
2685	3198 016 31020	1nF 25V
2686	3198 016 31020	1nF 25V
2690	4822 126 14305	100nF 10% 16V
2691	4822 126 14305	100nF 10% 16V
2692	4822 126 14305	100nF 10% 16V
2693	4822 126 13883	220pF 5% 50V
2702	4822 124 23002	10µF 16V
2703	4822 126 14305	100nF 10% 16V
2704	4822 124 23002	10µF 16V
2706	4822 124 12095	100µF 20% 16V
2707	4822 126 14305	100nF 10% 16V
2708	4822 124 23002	10µF 16V
2709	4822 126 14305	100nF 10% 16V
2710	4822 124 23002	10µF 16V
2712	4822 124 23002	10µF 16V
2713	4822 126 14305	100nF 10% 16V
2717	4822 126 14218	3.9pF 50V
2718	4822 126 11669	27pF
2719	4822 126 11663	12pF
2720	4822 126 14218	3.9pF 50V
2721	4822 126 11669	27pF
2723	4822 126 11663	12pF
2724	4822 126 14218	3.9pF 50V
2725	4822 126 11669	27pF
2726	4822 126 11663	12pF
2728	4822 126 14305	100nF 10% 16V
2729	4822 126 14225	56pF 5% 50V
2730	4822 126 14494	22nF 10% 25V
2731	4822 122 31765	100pF 2% 63V
2733	4822 126 14494	22nF 10% 25V
2738	4822 126 14494	22nF 10% 25V
2743	4822 126 14494	22nF 10% 25V
2747	4822 126 14507	18pF 5% 50V
2748	4822 126 14507	18pF 5% 50V
2755	4822 126 14305	100nF 10% 16V
2756	4822 126 14305	100nF 10% 16V
2757	4822 124 23002	10µF 16V
2758	4822 126 14305	100nF 10% 16V
2759	4822 126 14305	100nF 10% 16V
2760	4822 126 14305	100nF 10% 16V
2761	4822 126 14305	100nF 10% 16V
2762	4822 126 14305	100nF 10% 16V
2763	4822 126 14305	100nF 10% 16V
2764	4822 126 14305	100nF 10% 16V
2765	4822 126 14305	100nF 10% 16V
2766	4822 126 14305	100nF 10% 16V
2767	4822 126 14305	100nF 10% 16V
2770	4822 126 14305	100nF 10% 16V
2771	4822 126 14305	100nF 10% 16V
2772	4822 126 14305	100nF 10% 16V
2773	4822 126 14305	100nF 10% 16V
2774	4822 126 14305	100nF 10% 16V
2776	4822 126 14305	100nF 10% 16V
2785	4822 126 14305	100nF 10% 16V
2786	4822 126 14305	100nF 10% 16V
2788	4822 126 14305	100nF 10% 16V
2790	4822 126 14305	100nF 10% 16V
2792	4822 126 14305	100nF 10% 16V
2795	4822 126 14305	100nF 10% 16V
2796	4822 126 14305	100nF 10% 16V
2797	4822 126 13956	68pF 5% 63V
2798	3198 016 36810	680P 25V
2902	5322 126 11583	10nF 10% 50V

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3001	4822 051 30472	4k7 5% 0.062W
3002	4822 051 30472	4k7 5% 0.062W
3003	4822 051 30223	22k 5% 0.062W
3006	4822 051 30471	470Ω 5% 0.062W
3007	4822 117 13521	470Ω 5% 0.63W
3008	4822 117 13526	150Ω 5% 0.63W
3009	4822 051 30689	68Ω 5% 0.063W
3011	4822 051 30471	470Ω 5% 0.062W
3012	4822 051 30471	470Ω 5% 0.062W
3013	4822 051 30103	10k 5% 0.062W
3014	4822 051 30682	6k8 5% 0.062W
3015	4822 051 30474	470k 5% 0.062W
3016	4822 051 30152	1k5 5% 0.062W
3017	4822 051 30472	4k7 5% 0.062W
3018	4822 051 30103	10k 5% 0.062W
3019	4822 051 30472	4k7 5% 0.062W
3020	4822 051 30103	10k 5% 0.062W
3021	4822 051 30103	10k 5% 0.062W
3023	4822 051 30471	470Ω 5% 0.062W
3024	4822 051 30273	27k 5% 0.062W
3025	4822 051 30221	220Ω 5% 0.062W
3026	4822 051 30103	10k 5% 0.062W
3027	4822 117 12925	47k 1% 0.063W
3028	4822 051 30471	470Ω 5% 0.062W
3029	4822 051 30103	10k 5% 0.062W
3030	4822 051 30103	10k 5% 0.062W
3031	4822 051 30103	10k 5% 0.062W
3032	4822 051 30471	470Ω 5% 0.062W
3033	4822 051 30103	10k 5% 0.062W
3034	4822 051 30101	100Ω 5% 0.062W
3035	4822 117 13522	100Ω 5% 0.63W
3039	4822 051 30101	100Ω 5% 0.062W
3040	4822 051 30103	10k 5% 0.062W
3041	4822 051 30562	5k6 5% 0.063W
3044	2120 108 92846	4k7 5%
3058	4822 051 30682	6k8 5% 0.062W

3059	2322 704 66201	620Ω 1%
3060	4822 051 30103	10k 5% 0.062W
3061	4822 051 30103	10k 5% 0.062W
3062	4822 051 30103	10k 5% 0.062W
3064	4822 117 13522	100Ω 5% 0.63W
3073	4822 051 30471	470Ω 5% 0.062W
3074	4822 051 30471	470Ω 5% 0.062W
3075	4822 051 30103	10k 5% 0.062W
3076	4822 051 30471	470Ω 5% 0.062W
3077	4822 051 30272	2k7 5% 0.062W
3078	4822 051 30471	470Ω 5% 0.062W
3079	4822 051 30471	470Ω 5% 0.062W
3080	4822 051 30103	10k 5% 0.062W
3081	4822 051 30471	470Ω 5% 0.062W
3083	4822 051 30471	470Ω 5% 0.062W
3084	4822 051 30103	10k 5% 0.062W
3085	4822 051 30471	470Ω 5% 0.062W
3086	4822 051 30471	470Ω 5% 0.062W
3087	4822 051 30471	470Ω 5% 0.062W
3088	4822 051 30471	470Ω 5% 0.062W
3090	4822 051 30471	470Ω 5% 0.062W
3091	4822 051 30471	470Ω 5% 0.062W
3092	4822 051 30221	220Ω 5% 0.062W
3300	2322 750 63908	3Ω9 5%
3304	2322 750 63908	3Ω9 5%
3306	4822 051 30221	220Ω 5% 0.062W
3307	4822 051 30183	18k 5% 0.062W
3308	4822 051 30684	680k 5% 0.062W
3310	4822 117 12925	47k 1% 0.063W
3311	4822 117 13632	100k 1% 0.62W
3314	4822 051 30103	10k 5% 0.062W
3315	4822 051 30102	1k 5% 0.062W
3316	4822 051 30123	12k 5% 0.062W
3317	4822 051 30221	220Ω 5% 0.062W
3318	4822 051 30102	1k 5% 0.062W
3320	4822 051 30101	100Ω 5% 0.062W
3321	4822 051 30101	100Ω 5% 0.062W
3322	4822 051 10102	1k 2% 0.25W
3324	4822 051 30222	2k2 5% 0.062W
3327	4822 117 13632	100k 1% 0.62W
3328	4822 051 30393	39k 5% 0.062W
3329	4822 117 13568	6Ω8 5%
3330	4822 051 30332	3k3 5% 0.062W
3331	4822 051 30102	1k 5% 0.062W
3333	4822 051 30102	1k 5% 0.062W
3334	4822 051 30102	1k 5% 0.062W
3335	4822 051 30332	3k3 5% 0.062W
3336	4822 051 30102	1k 5% 0.062W
3337	4822 117 12903	1k8 1% 0.063W
3338	4822 051 30682	6k8 5% 0.062W
3340	4822 051 30101	100Ω 5% 0.062W
3341	4822 051 30101	100Ω 5% 0.062W
3342	4822 051 30101	100Ω 5% 0.062W
3343	4822 051 30683	68k 5% 0.062W
3344	4822 051 30222	2k2 5% 0.062W
3345	4822 051 30103	10k 5% 0.062W
3346	4822 051 30333	33k 5% 0.062W
3347	4822 051 30223	22k 5% 0.062W
3348	4822 051 30222	2k2 5% 0.062W
3362	4822 051 30103	10k 5% 0.062W
3363	4822 051 30102	1k 5% 0.062W
3364	4822 051 30683	68k 5% 0.062W
3365	4822 051 30472	4k7 5% 0.062W
3366	4822 051 30102	1k 5% 0.062W
3367	4822 051 30102	1k 5% 0.062W
3370	4822 051 30101	100Ω 5% 0.062W
3371	4822 051 30479	47Ω 5% 0.062W
3372	4822 051 30471	470Ω 5% 0.062W
3376	4822 051 30101	100Ω 5% 0.062W
3377	4822 051 30101	100Ω 5% 0.062W
3378	4822 051 30153	15k 5% 0.062W
3382	4822 051 30471	470Ω 5% 0.062W
3384	4822 051 30101	100Ω 5% 0.062W
3385	4822 051 30471	470Ω 5% 0.062W
3386	4822 051 30223	22k 5% 0.062W
3388	4822 051 30102	1k 5% 0.062W
3389	4822 117 12925	47k 1% 0.063W
3390	4822 051 30153	15k 5% 0.062W
3391	4822 051 30683	68k 5% 0.062W
3393	4822 117 13632	100k 1% 0.62W
3394	4822 051 30472	4k7 5% 0.062W
3400	4822 117 11152	4Ω7 5%
3406	4822 051 30479	47Ω 5% 0.062W
3411	4822 051 30472	4k7 5% 0.062W
3414	4822 051 30472	4k7 5% 0.062W
3415	4822 117 12902	8k2 1% 0.063W
3416	4822 117 13568	6Ω8 5%
3418	4822 051 30391	390Ω 5% 0.062W
3419	4822 051 30759	75Ω 5% 0.062W
3435	4822 051 30472	4k7 5% 0.062W
3436	4822 051 30221	220Ω 5% 0.062W
3437	4822 051 30102	1k 5% 0.062W
3439	4822 051 30471	470Ω 5% 0.062W
3441	4822 051 30393	39k 5% 0.062W
3445	4822 051 30471	470Ω 5% 0.062W
3446	4822 051 30101	100Ω 5% 0.062W
3532	4822 051 30102	1k 5% 0.062W
3533	4822 051 30103	10k 5% 0.062W
3540	4822 051 30103	10k 5% 0.062W
3550	4822 051 30102	1k 5% 0.062W
3551	4822 051 30102	1k 5% 0.062W
3552	4822 051 30472	4k7 5% 0.062W
3610	4822 117 12925	47k 1% 0.063W
3611	4822 117 12925	47k 1% 0.063W
3612	4822 117 12925	47k 1% 0.063W
3613	4822 117 12925	47k 1% 0.063W
3614	4822 117 12925	47k 1% 0.063W
3615	4822 117 12925	47k 1% 0.063W
3616	4822 051 30682	6k8 5% 0.062W
3617	4822 051 30682	6k8 5% 0.062W
3621	4822 051 30105	1M 5% 0.062W
3636	4822 051 30105	1M 5% 0.062W
3637	4822 051 30105	1M 5% 0.062W
3638	4822 051 30105	1M 5% 0.062W
3642	4822 051 30105	1M 5% 0.062W
3644	4822 051 30105	1M 5% 0.062W
3653	3198 021 90030	JUMPER
3654	3198 021 90030	JUMPER
3655	4822 051 30101	100Ω 5% 0.062W
3656	4822 051 30101	100Ω 5% 0.062W
3657	4822 051 30334	330k 5% 0.062W
3658	4822 051 30334	330k 5% 0.062W
3659	4822 051 30334	330k 5% 0.062W
3660	4822 051 30334	330k 5% 0.062W
3661	4822 117 11817	1k2 1% 1/16W
3662	4822 117 11817	1k2 1% 1/16W
3663	4822 117 11817	1k2 1% 1/16W
3665	4822 051 30272	2k7 5% 0.062W
3673	4822 051 30472	4k7 5% 0.062W
3676	4822 117 11817	1k2 1% 1/16W
3677	4822 051 30334	330k 5% 0.062W
3678	4822 117 11817	1k2 1% 1/16W
3679	4822 051 30334	330k 5% 0.062W
3680	4822 117 11817	1k2 1% 1/16W
3683	4822 051 30272	2k7 5% 0.062W
3684	3198 021 90030	JUMPER
3685	3198 021 90030	JUMPER
3688	3198 021 90030	JUMPER
3689	3198 021 90030	JUMPER
3702	4822 117 12139	22Ω 5% 0.062W
3703	4822 051 30101	100Ω 5% 0.062W
3705	4822 051 30101	100Ω 5% 0.062W
3706	4822 051 30109	10Ω 5% 0.062W
3707	4822 051 30392	3k9 5% 0.063W
3708	4822 051 30272	2k7 5% 0.062W
3709	3198 021 90030	JUMPER
3710	4822 051 30391	390Ω 5% 0.062W
3711	4822 051 30102	1k 5% 0.062W
3712	4822 051 30391	390Ω 5% 0.062W
3713	4822 051 30391	390Ω 5% 0.062W
3714	4822 117 12139	22Ω 5% 0.062W
3716	4822 051 30472	4k7 5% 0.062W
3717	4822 051 30472	4k7 5% 0.062W
3718	4822 051 30221	220Ω 5% 0.062W
3719	4822 117 13574	1Ω5 5% 1206
3720	4822 117 13574	1Ω5 5% 1206
3721	4822 117 13572	22Ω 5% 1206
3722	4822 117 13572	22Ω 5% 1206
3725	4822 051 30105	1M 5% 0.062W
3728	4822 051 30101	100Ω 5% 0.062W
3731	4822 051 30101	100Ω 5% 0.062W
3732	4822 051 10102	1k 2% 0.25W
3733	4822 051 30101	100Ω 5% 0.062W
3739	4822 051 30101	100Ω 5% 0.062W
3740	3198 021 90030	JUMPER
3741	4822 051 30102	1k 5% 0.062W
3744	4822 051 30102	1k 5% 0.062W
3745	4822 051 30102	1k 5% 0.062W
3746	4822 051 30472	4k7 5% 0.062W
3747	4822 051 30689	68Ω 5%
3748	4822 051 30689	68Ω 5%
3749	4822 051 30689	68Ω 5% 0.063W
3754	4822 051 30109	10Ω 5% 0.062W
3755	3198 021 90030	JUMPER
3757	3198 021 90030	JUMPER
3759	3198 021 90030	JUMPER
3790	4822 117 13522	100Ω 5% 0.63W
3791	4822 117 13522	100Ω 5% 0.63W
3792	4822 117 13522	100Ω 5% 0.63W
3793	4822 117 12662	10Ω 5%
3793	4822 117 13522	100Ω 5% 0.63W
3794	4822 117 12662	10Ω 5%
3794	4822 117 13522	100Ω 5% 0.63W
3795	4822 117 12662	10Ω 5%
3795	4822 117 13522	100Ω 5% 0.63W
3796	4822 051 30101	100Ω 5% 0.062W
3796	4822 051 30109	10Ω 5% 0.062W
3797	4822 051 30101	100Ω 5% 0.062W
3900	4822 051 30221	220Ω 5% 0.062W
3901	4822 051 30221	220Ω 5% 0.062W
3903	4822 051 30221	220Ω 5% 0.062W
3905	4822 051 30221	220Ω 5% 0.062W
3906	4822 051 30101	100Ω 5% 0.062W
3907	4822 051 30221	220Ω 5% 0.062W
3909	4822 051 30221	220Ω 5% 0.062W
3910	4822 051 30221	220Ω 5% 0.062W
3911	4822 051 30101	100Ω 5% 0.062W

5301	4822 157 11876	6.8μH 10%
5302	4822 157 11876	6.8μH 10%
5403	2422 549 44461	IND VAR 40mH
5404	2422 535 95427	100mH
5405	2422 535 95427	IND FXD 100mHz 120R
5406	3198 018 33980	3U9 10%
5407	3198 018 56880	6U8 10%
5408	2422 549 44459	IND VAR 78mH
5409	3198 018 51080	1U 10%
5410	3198 018 33370	0U33 10%
5651	2422 549 43769	100mH
5652	2422 549 43769	100mH
5653	2422 549 43769	100mH
5654	4822 157 11716	BLM21P300SPT
5701	4822 157 71206	BLM21A601SPT
5702	2422 535 95427	100mH
5703	4822 157 11716	BLM21P300SPT
5704	4822 157 11716	BLM21P300SPT
5705	2422 535 95427	100mH
5706	4822 157 11778	5U6 10%
5707	4822 157 11781	BLM11A601SPT1
5708	4822 157 11778	5U6 10%
5709	4822 157 11778	5U6 10%
5710	4822 157 11778	5U6 10%
5711	4822 157 11781	BLM11A601SPT1
5713	4822 157 11781	BLM11A601SPT1
5718	3198 018 33370	0U33 10%
5720	4822 157 11781	BLM11A601SPT1
5910	4822 157 11781	BLM11A601SPT1

6001	4822 130 11528	1PS76SB10
6003	4822 130 11528	1PS76SB10
6303	4822 130 11594	BZX284-C47
6304	4822 130 83757	BAS216
6306	9322 129 37685	BZM55-C5V6
6307	4822 130 11528	1PS76SB10
6309	4822 130 83757	BAS216
6310	9322 129 38685	BZM55-C6V8
6311	9322 149 08685	BZM55-C22
6319	4822 130 83757	BAS216
6334	4822 130 83757	BAS216
6403	4822 130 10414	BA792
6652	9322 129 40685	BZM55-C10
6653	4822 130 83757	BAS216

7001	9352 629 88557	SAA5801/011 V30
7002	5322 130 42756	BC857C
7003	3198 010 42310	BC847BW
7004	3198 010 42310	BC847BW
7005	9322 116 74668	LD1117D33
7006	3104 317 42211	SOFTW.ASSY 310431702211
7007	9322 136 53668	MSM51V18165D-60JS
7008	3198 010 42310	BC847BW
7009	3198 010 42310	BC847BW
7010	5322 130 42756	BC857C
7011	4822 209 17377	M24C32-WMN6/PROG
7301	9352 625 23518	TDA9330H/N2
7303	5322 130 42756	BC857C
7308	9340 310 30215	PDTC144ET
7309	9340 310 30215	PDTC144ET
7310	9340 310 30215	PDTC144ET
7311	3198 010 42310	BC847BW
7312	3198 010 42310	BC847BW
7320	3198 010 42310	BC847BW
7322	3198 010 42310	BC847BW
7323	9352 625 24518	TDA9321H/N2

7324	5322 130 63679	BC847CW
7403	4822 130 60511	BC847B
7407	4822 130 60373	BC856B
7411	4822 130 60511	BC847B
7651	9322 143 53671	MSP3415D-FH-B3
7651	9322 149 63671	MSP3451G-FH-A1
7652	9351 874 90118	74HC4052PW
7656	9340 425 20115	BC847BS
7658	9340 425 20115	BC847BS
7663	9340 425 20115	BC847BS
7674	3198 010 42310	BC847BW
7675	9351 874 90118	74HC4052PW
7680	3198 010 42310	BC847BW
7681	3198 010 42310	BC847BW
7701	5322 130 42756	BC857C
7702	3198 010 42310	BC847BW
7704	4822 209 73852	PMBT2369
7708	4822 209 90034	SAA4990H/V0
7709	9352 640 20557	SAA4978H/V203
7713	9322 116 74668	LD1117D33
7714	4822 209 17307	MSM54V12222A-30JS
7715	4822 209 17307	MSM54V12222A-30JS
7716	2422 486 80737	IC SOCKET 32P
	3104 317 42341	IC SOFTWARE

Main Switch Panel [E]

Various

0151	4822 256 91766	LED HOLDER
0201	2422 025 16268	2P MALE
0202	2422 025 16374	2P MALE
0923	2412 020 00724	2P MALE
0947	4822 267 10734	5P MALE
1910	4822 130 91478	IR RECEIVER
1951	4822 276 14024	2P 4/128A

⊣⊢

2930	4822 124 41584	100µF 20% 10V

-▭-

3957	4822 053 21335	3M3 5% 0.5W
3966	4822 053 21335	3M3 5% 0.5W
3978	4822 051 20101	100Ω 5% 0.1W
3982	4822 117 13577	330Ω 1% 1.25W

▶|

6901	4822 130 10859	TLDR5400

CRT Panel [F]

Various

0298	2422 500 80052	9P FEMALE
0340	3104 311 02321	CABLE 11P 400mm
0383	2422 025 16382	3P MALE

⊣⊢

2300	4822 124 40764	22µF 100 V
2301	4822 124 40196	220µF 20% 16V
2302	5322 122 32286	3.3pF 5% 50V
2303	5322 122 32268	470pF 10% 50V
2304	4822 121 41856	22nF 5% 250V
2305	4822 124 41751	47µF 20% 50V
2306	4822 126 14585	100nF 10% 50V
2307	5322 122 32654	22nF 10% 63V
2308	4822 126 13486	15pF 2% 63V
2309	5322 122 32654	22nF 10% 63V
2310	4822 126 13689	18pF 1% 63V
2312	5322 122 32658	22pF 5% 50V
2313	4822 124 11565	10µF 20% 250V
2316	4822 121 40518	100nF 10% 250V
2317	5322 121 44356	4.7nF 5% 2KV
2318	5322 122 32654	22nF 10% 63V
2320	4822 126 13838	100nF 20% 50V
2321	5322 122 32531	100pF 5% 50V
2322	5322 122 32531	100pF 5% 50V
2323	5322 122 32531	100pF 5% 50V
2325	4822 126 14585	100nF 10% 50V

-▭-

3300	4822 052 10109	10Ω 5% 0.33W
3301	4822 053 12103	10k 5% 3W
3302	4822 051 20182	1k8 5% 0.1W
3303	4822 117 10965	18k 1% 0.1W
3304	4822 117 11454	820Ω 1% 0.1W
3305	4822 117 13577	330Ω 1% 1.25W
3306	4822 051 20478	4Ω7 5% 0.1W
3307	4822 051 20109	10Ω 5% 0.1W
3308	4822 117 11148	56k 1% 0.1W
3309	4822 117 10353	150Ω 1% 0.1W
3310	4822 051 10102	1k 2% 0.25W
3311	4822 051 20101	100Ω 5% 0.1W
3312	4822 117 11449	2k2 1% 0.1W
3313	4822 116 83872	220Ω 5% 0.5W
3314	4822 116 83872	220Ω 5% 0.5W
3315	4822 117 11139	1k5 1% 0.1W
3316	4822 117 11148	56k 1% 0.1W
3317	4822 051 20122	1k2 5% 0.1W
3318	4822 051 20159	15Ω 5% 0.1W
3319	4822 117 11454	820Ω 1% 0.1W
3320	4822 051 10102	1k 2% 0.25W
3334	4822 050 11002	1k 1% 0.4W
3335	4822 051 10102	1k 2% 0.25W
3336	4822 051 10102	1k 2% 0.25W
3337	4822 051 10102	1k 2% 0.25W
3338	3198 013 01020	1k 2% 1/2W
3339	3198 013 01020	1k 2% 1/2W
3340	3198 013 01020	1k 2% 1/2W
3341	4822 052 10151	150Ω 5% 0.33W
3342	4822 051 20471	470Ω 5% 0.1W
3344	4822 116 52191	33Ω 5% 0.5W
3345	4822 116 52191	33Ω 5% 0.5W
3347	3198 013 01520	1k5 2% 1/2W
3348	4822 050 11204	120k 1% 0.4W
3349	3198 013 01020	1k 2% 1/2W
3350	4822 116 83883	470Ω 5% 0.5W
3351	4822 116 83883	470Ω 5% 0.5W
3352	4822 116 83883	470Ω 5% 0.5W
3354	4822 117 11449	2k2 1% 0.1W
3355	4822 051 20478	4Ω7 5% 0.1W
3356	4822 051 10102	1k 2% 0.25W
3357	4822 051 20478	4Ω7 5% 0.1W
4xxx	4822 051 10008	0Ω 5% 0.25W
4xxx	4822 051 20008	0Ω 5% 0.25W

∼

5300	2422 531 98035	TFM S13974-01 Y

▶|

6305	4822 130 30842	BAV21
6306	4822 130 30842	BAV21
6307	4822 130 30842	BAV21
6310	4822 130 83757	BAS216

⊗ ▭

7300	4822 130 44154	BF199
7301	4822 130 42589	BF370
7302	5322 130 41888	BD140-16
7303	5322 130 41886	BD139-16
7307	9352 561 40112	TDA6108
8317	3104 311 01901	CABLE 2P 560mm
8325	3104 311 01911	CABLE 3P 680mm

Side I/O Panel [O]

Various

0900	2422 026 04926	4P FEMALE
0901	4822 267 10975	3P
0902	4822 267 31014	HEADPHONE SOCKET
0936	2422 025 12485	11P MALE

⊣⊢

2905	4822 122 33177	10nF 20% 50V
2906	4822 122 33177	10nF 20% 50V

-▭-

3901	4822 051 20101	100Ω 5% 0.1W
3902	4822 116 52201	75Ω 5% 0.5W
3903	4822 051 20101	100Ω 5% 0.1W
3904	4822 116 52201	75Ω 5% 0.5W
3905	4822 050 11002	1k 1% 0.4W
3906	4822 050 11002	1k 1% 0.4W
3907	4822 117 10834	47k 1% 0.1W
3908	4822 050 11002	1k 1% 0.4W
3909	4822 117 10834	47k 1% 0.1W
3910	4822 116 52276	3k9 5% 0.5W
3911	4822 050 21003	10k 1% 0.6W
3912	4822 050 21003	10k 1% 0.6W

Top Control Panel [P]

Various

0345	4822 267 10748	3P MALE
1701	4822 276 13775	SWITCH
1702	4822 276 13775	SWITCH
1703	4822 276 13775	SWITCH
1704	4822 276 13775	SWITCH
1705	4822 276 13775	SWITCH

-▭-

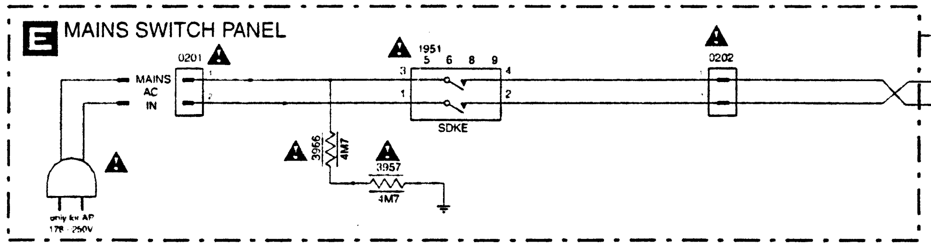
3701	4822 051 20391	390Ω 5% 0.1W
3702	4822 117 13528	200Ω 1% 0.125W
3703	4822 117 10845	620Ω 1% 0.1W
3704	4822 117 11534	1k1 1% 0.1W
3705	4822 117 11951	2k 1% 0.1W
3999	4822 051 10102	1k 2% 0.25W

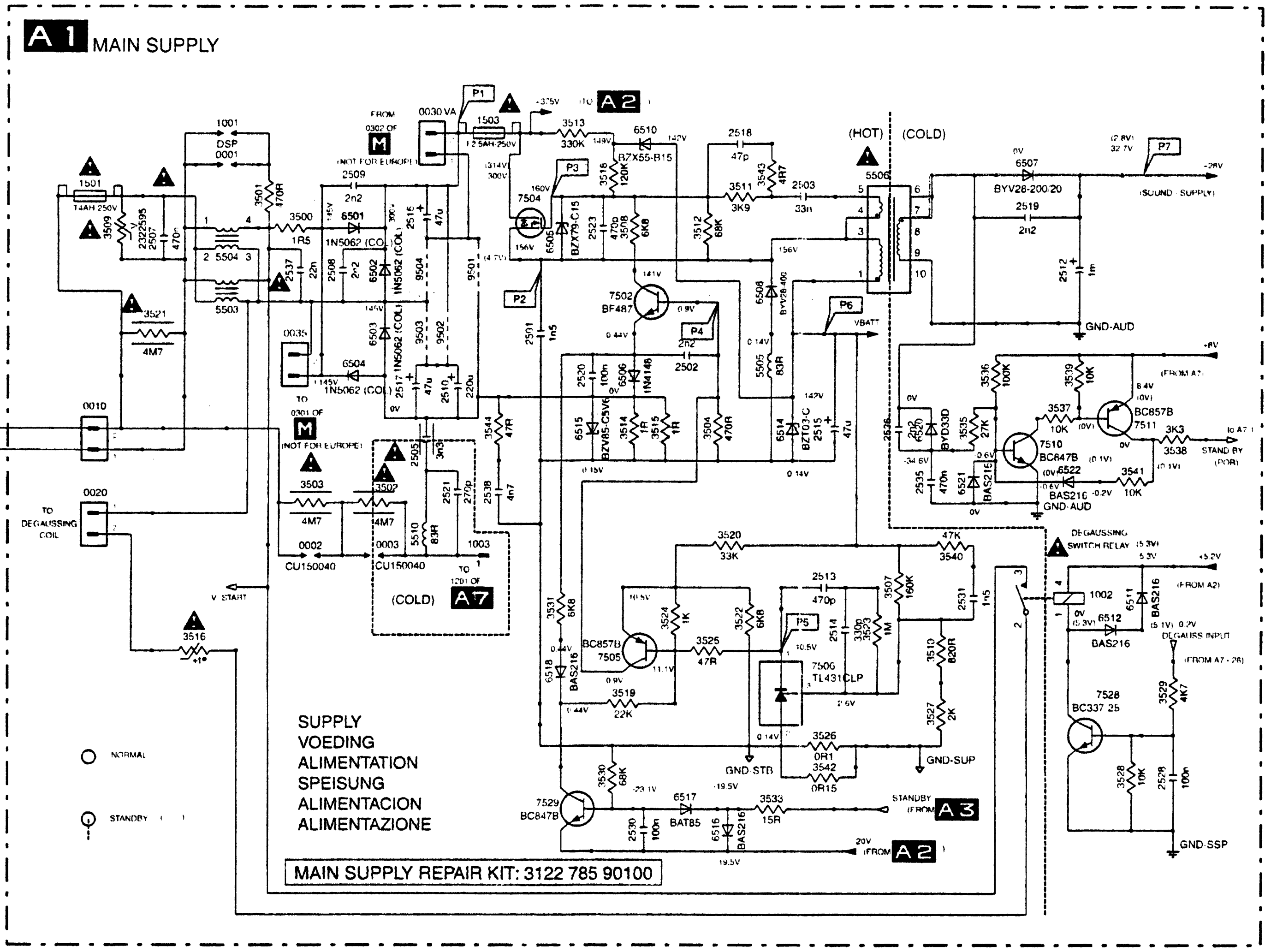
A LSP (Large Signal Panel)

Error	Device	Description	Defective item	Diagram	Defect. module indication
1	29"	NVM	7011	B5	Control
2	1N	HFB			Horizontal Flyback
3	560N	PICNIC	7709	B3	Feature Box
4	-	5V2			+5V Supply
5	10N	8V6			+8V Supply
6	22N				Slow I²C blocked
7	6N8	HOP video control/geometry	7301	B4	Video Controller
8	560N	HIP I/O-video processing	7323	B2	Chroma IF IO
9	-			A3	
10	1N				
11	3W 15R				
12	100R	TUNER_PROT			+8V (Tuner) Supply
13	6K8	Tuner	U1200	A7	Tuner
14	-	ITT sound processor + Dolby	7651	B6	Audio Module
15	22K				
16	FUSE 8R2	FBX_PROT			

Error Code Table

Error messages


E MAINS SWITCH PANEL
0201
MAINS AC IN
1951
SDKE
3956 4M7
3957 4M7
0202
only for AP 170 - 250V


A1 MAIN SUPPLY
A2
1001 DSP 0001
1501
3509
5504
5503
3500
6501 1N5062 (COL)
6502
6503
6504 1N5062 (COL)
2509
2512
1503
3513 330K
6510 BZX55-B15
2518 47p
3511 3K9
2503 33n
5506
(HOT) (COLD)
6507 BYV28-200/20
2519 2n2
P1 P2 P3 P4 P5 P6 P7
7504
7502 BF487
2502
(SOUND SUPPLY)
GND-AUD
0010
0020
TO DEGAUSSING COIL
0035
3503 4M7
3502 4M7
0002 CU150040
0003 CU150040
(COLD) A7
3521 4M7
3516
V START
3520 33K
3540 47K
2513 470p
7505 BC857B
3525 47R
3519 22K
7506 TL431CLP
3526 0R1
3542 0R15
7529 BC847B
6517 BAT85
3533 15R
STANDBY (FROM A3)
20V (FROM A2)
GND-STB
GND-SUP
7510 BC847B
7511 BC857B
3537 10K
3538 3K3
3541 10K
6522 BAS216
STAND BY (POR)
DEGAUSSING SWITCH RELAY
1002
6512 BAS216
DEGAUSS INPUT
7528 BC337-25
GND-SSP
NORMAL
STANDBY
SUPPLY
VOEDING
ALIMENTATION
SPEISUNG
ALIMENTACION
ALIMENTAZIONE
MAIN SUPPLY REPAIR KIT: 3122 785 90100

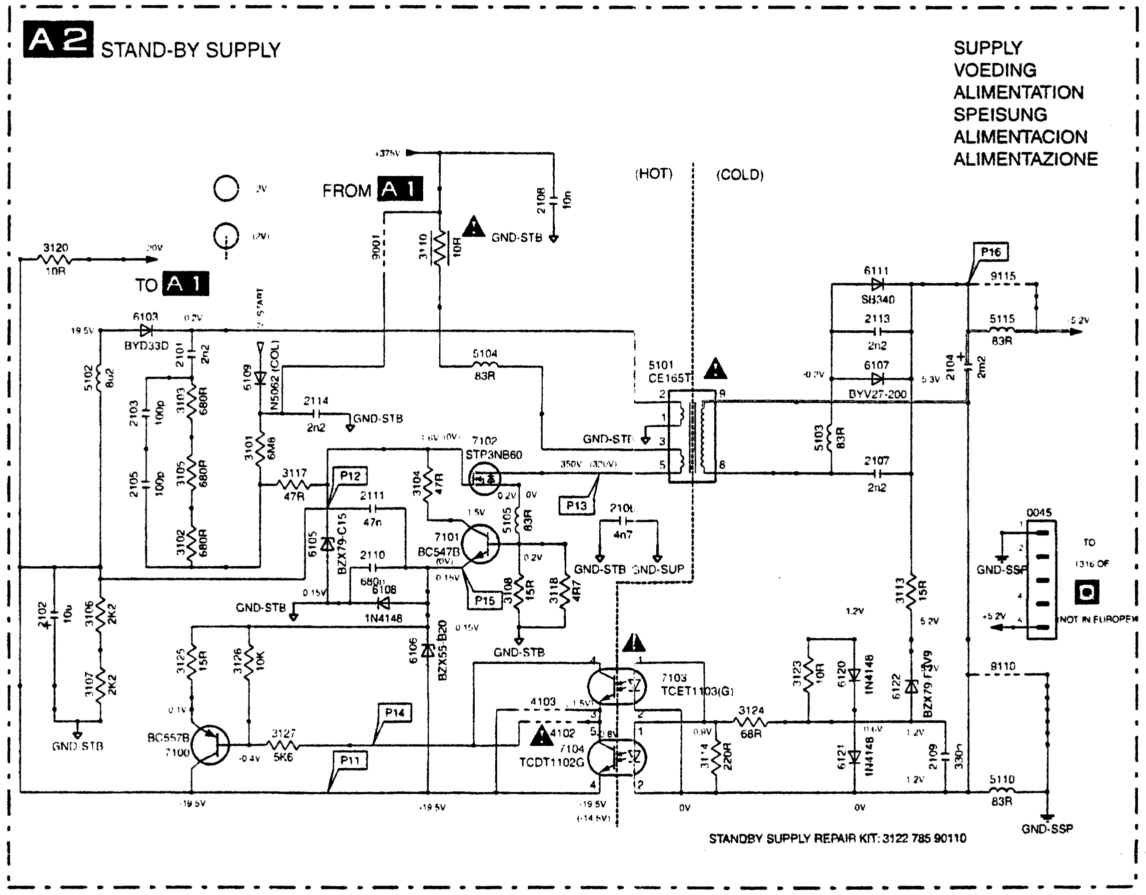
Diversity Tables

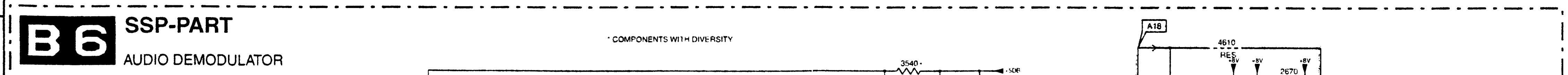
Diversity Large Signal Panel (A1)					
PosNr	29"	25"	28"	28" WS	32" WS
8000	CBLE DIP 2P/340mm	CBLE HR 3P/340mm	CBLE HR 3P/340mm	CBLE DIP 2P/340mm	CBLE DIP 2P/340mm

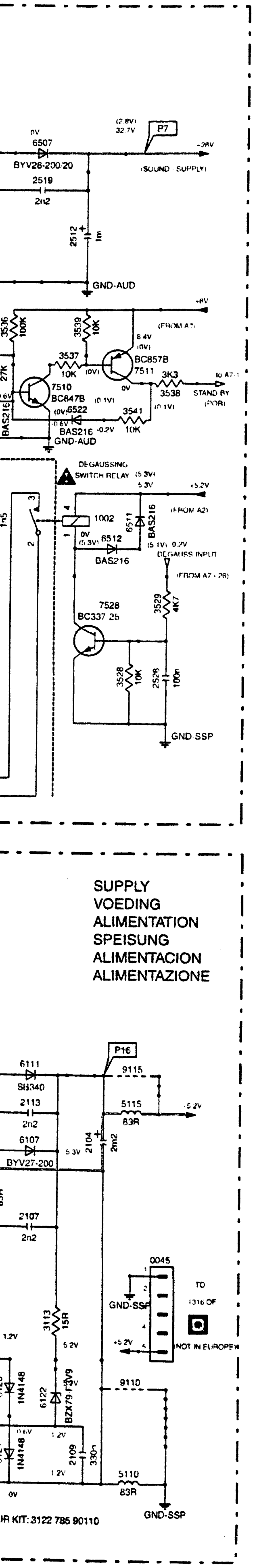
Diversity Large Signal Panel (A3)					
PosNr	29"	25"	28"	28" WS	32" WS
2420	1N	1N	1N	560P	1N
2421	560N	560N	470N	-	-
2422	-	-	-	21U2	21U2
2425	10N	9N1	-	11N	11N
2426	22N	24N	24N	24N	24N
2431	6N8	3N3	3N3	3N3	3N3
2433	560N	390N	470N	390N	430N
2435	-	-	9N1	-	-
2455	1N	-	-	3N3	3N3
3415	3W 15R	3W 15R	3W 15R	PR03 12R	PR03 12R
3431	100R	220R	220R	220R	220R
3450	6K8	-	-	10K	10K
3450	-	8K2	8K2	-	-
3451	22K	22K	22K	10K	10K
3466	FUSE 8R2	6R8	FUSE 8R2	1R	1R
3488	330K	220K	220K	220K	120K
5421	COI LINCOR DRUM	COI LINCOR DC12 8MH	COI LINCOR DRUM	COI LINCOR DRUM	COI LINCOR DRUM
5422	COI BRIDGE	-	-	COI BRIDGE	COI BRIDGE
5424	-	COI BRIDGE	COI BRIDGE	-	-
5430	LOT 30KV ISO ELDOR	LOT PWRSL. 27K5	LOT PWRSL. 27K5	LOT PWRSL. 30KV	LOT PWRSL. 30KV
2445	-	-	-	-	1U
2446	-	-	-	-	470P
2447	-	-	-	-	470P
3439	-	-	-	-	100R
3440	-	-	-	-	22K
3441	-	-	-	-	470K
3442	-	-	-	-	470K
3443	-	-	-	-	100R
3444	-	-	-	-	39K
3445	-	-	-	-	2K2
3446	-	-	-	-	2K2
3447	-	-	-	-	22R
4441	-	-	-	-	JUMP
6440	-	-	-	-	SMAS216
6441	-	-	-	-	SMAS216

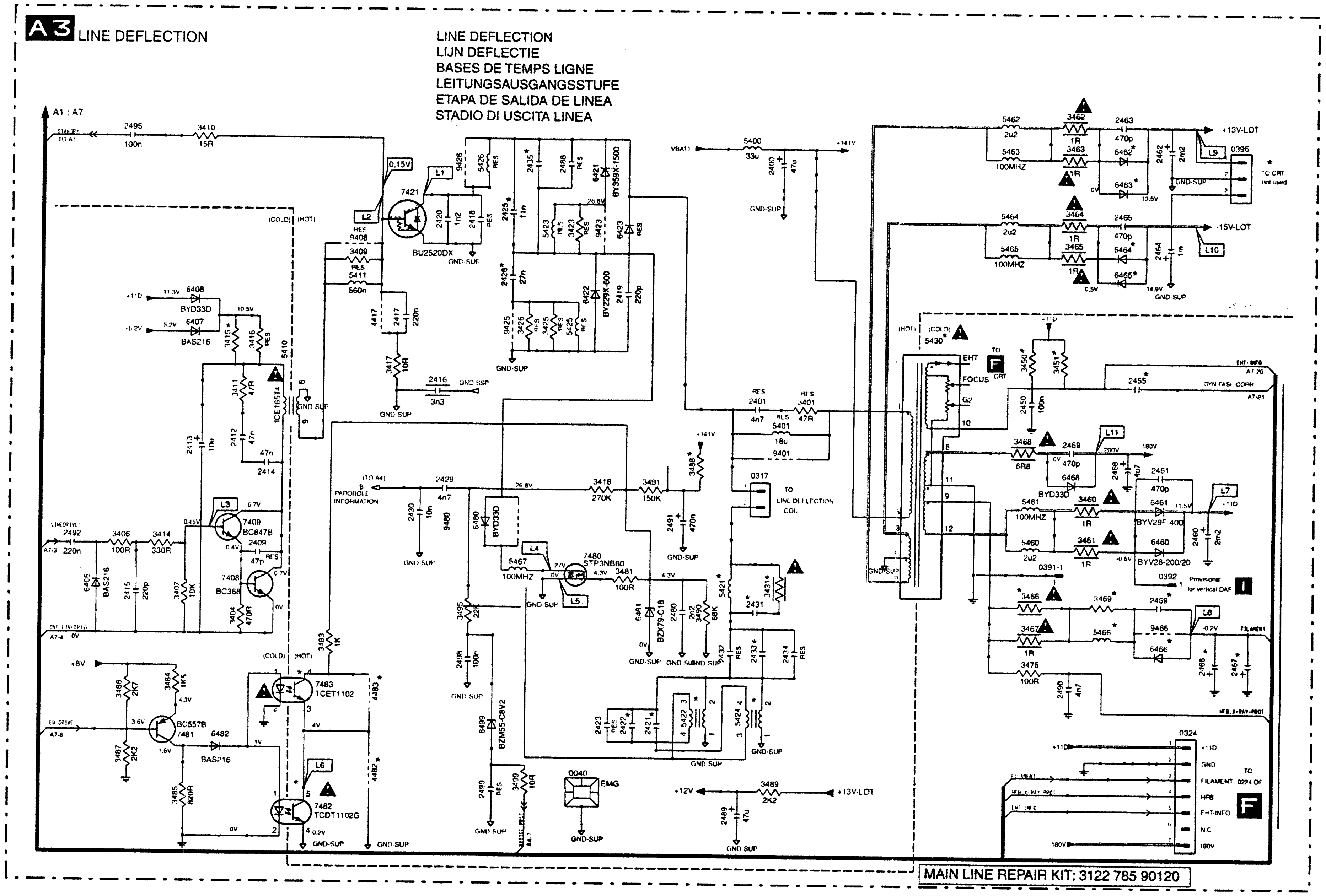
Diversity Large Signal Panel (A4)					
PosNr	29"	25"	28"	28" WS	32" WS
0390	-	-	-	-	CON 03P
3602	3K3	3K3	3K3	-	-
3611	-	-	-	8K2	8K2
3614	1M	1M	1M	1M2	1M2
3615	470K	560K	560K	560K	560K
3621	1R	1R5	1R5	1R5	1R5
3622	1R	1R	1R	1R8	1R8
6600	1N4148	1N4148	1N4148	SIGAT85	SIGAT85
6621	ECYD33D	-	-	ECYD33D	ECYD33D
6622	DIO	-	-	DIO	DIO
7440	-	-	-	-	LM358N
7441	-	-	-	-	SIGC547B
7442	-	-	-	-	SIGC557B
9622	-	WR	WR	-	-

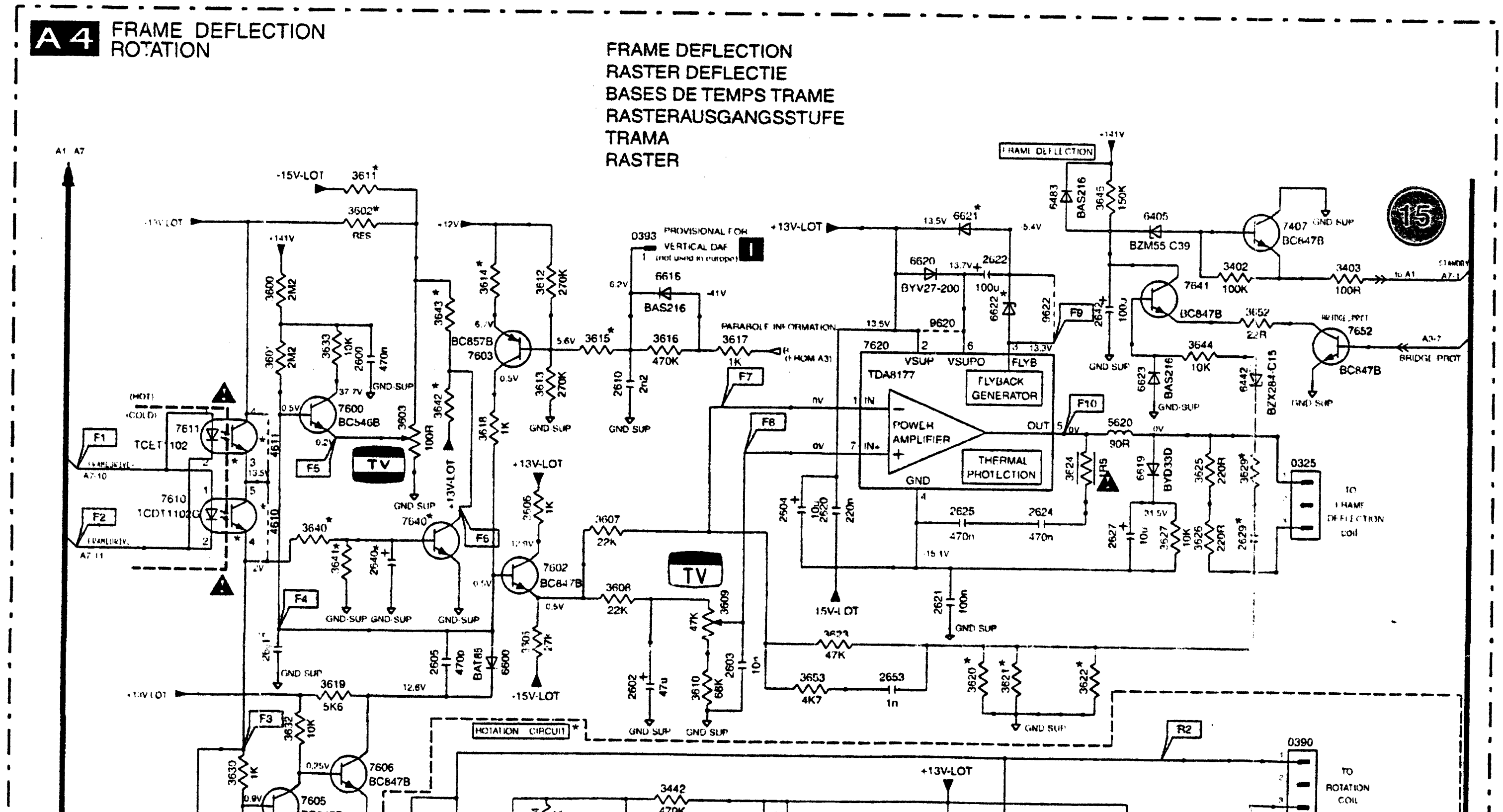
Diversity Small Signal Panel (B6)			
Item	100HZ INCR ST	DS VIRT DLB	100HZ DLB
2636	220N	-	-
2638	220N	-	-
2641	220N	-	-
2642	220N	-	-
2663	-	470P	470P
2664	-	470P	470P
2677	2U2	10U	10U
2678	-	10U	10U
2678	-	10U	10U
2685	-	1N	1N
2686	-	1N	1N
2692	100N	-	-
3552	4K7	-	-
3617	6K8	-	-
3636	1M	-	-
3638	1M	-	-
3642	1M	-	-
3644	1M	-	-
3657	330K	-	-
3659	330K	-	-
3661	1K2	-	-
3663	1K2	-	-
3665	2K7	-	-
3676	1K2	-	-
3677	330K	-	-
3678	1K2	-	-
3679	330K	-	-
4605	-	JUMP	JUMP
4606	-	JUMP	JUMP
4613	-	JUMP	JUMP
4615	-	JUMP	JUMP
4620	-	JUMP	JUMP
4621	-	JUMP	JUMP
4630	JUMP	-	-
4631	JUMP	-	-
4632	-	JUMP	JUMP
4633	-	JUMP	JUMP
4634	-	JUMP	JUMP
4635	-	JUMP	JUMP
4650	-	JUMP	JUMP
4651	-	JUMP	JUMP
4678	-	JUMP	JUMP
4679	-	JUMP	JUMP
4680	JUMP	-	-
4681	JUMP	-	-
7651	MSP3415D-FH-B3	MSP3451G-FH-A1	MSP3451G-FH-A1
7658	BC847BS	-	-
7663	BC847BS	-	-
7675	74HC4052PW	-	-
7681	BC847BW	-	-


A2 STAND-BY SUPPLY
SUPPLY
VOEDING
ALIMENTATION
SPEISUNG
ALIMENTACION
ALIMENTAZIONE
FROM A1
TO A1
(HOT) (COLD)
3120 10R
6103 BYD33D
5101 CE165T
7102 STP3NB60
7101 BC547B
7100 BC557B
6105 BZX79-C15
6106 BZX55-B20
6108 1N4148
7103 TCET1103(G)
7104 TCDT1102G
6111 SB340
6107 BYV27-200
5115 83R
5110 83R
0045
TO 1316 OF D NOT IN EUROPE
P11 P12 P13 P14 P15 P16
GND-STB
GND-SUP
GND-SSP
STANDBY SUPPLY REPAIR KIT: 3122 785 90110


B6 SSP-PART
AUDIO DEMODULATOR
* COMPONENTS WITH DIVERSITY
3540
A18
4610 RES
2670


SUPPLY
VOEDING
ALIMENTATION
SPEISUNG
ALIMENTACION
ALIMENTAZIONE
DEGAUSSING SWITCH RELAY
BYV26-200/20
BC847B
BC337-25
BAS216
GND-AUD
GND-SSP
P7
P16
(SOUND SUPPLY)
STAND BY
DEGAUSS INPUT
NOT IN EUROPE
SB340
BYV27-200
BZX79
1N4148
IR KIT: 3122 785 90110


A3 LINE DEFLECTION
LINE DEFLECTION
LIJN DEFLECTIE
BASES DE TEMPS LIGNE
LEITUNGSAUSGANGSSTUFE
ETAPA DE SALIDA DE LINEA
STADIO DI USCITA LINEA
A1 : A7
BU2520DX
BY359X-1500
BY229X-600
BYD33D
BAS216
BC847B
BC368
STP3NB60
BZX79-C18
BC557B
1CET1102
TCDT1102G
BZM55-C8V2
BYV29F 400
BYV28-200/20
BYD33D
GND-SUP
EHT
FOCUS
G2
TO CRT
LINE DEFLECTION COIL
PARABOLE INFORMATION
+13V-LOT
-15V-LOT
EMG
FILAMENT
HFB
EHT-INFO
N.C.
180V
TO FILAMENT 0224 OF
F
MAIN LINE REPAIR KIT: 3122 785 90120


A4 FRAME DEFLECTION ROTATION
FRAME DEFLECTION
RASTER DEFLECTIE
BASES DE TEMPS TRAME
RASTERAUSGANGSSTUFE
TRAMA
RASTER
A1 : A7
15
TDA8177
POWER AMPLIFIER
FLYBACK GENERATOR
THERMAL PROTECTION
VSUP
VSUPO
FLYB
OUT
GND
IN-
IN+
TV
BC546B
BC857B
BC847B
BYV27-200
BAS216
BZM55 C39
BYD33D
BAT85
FRAME DEFLECTION
PARABOLE INFORMATION
PROVISIONAL FOR VERTICAL DAF
BRIDGE PROT
TO FRAME DEFLECTION COIL
ROTATION CIRCUIT
TO ROTATION COIL
+13V-LOT
-15V-LOT

AFTER 5 TIMES OF STANDBY TO PROTECTION

— SUPPLY

● PROTECTION ERROR

○ NON-PROTECTION ERROR

0001	B3	3107	L13	3739	S20	7733	U26
0002	D13	3108	K16	3740	T20	7740	U28
0003	D14	3110	I15	3741	R20	7750	Q28
0010	C12	3113	K18	3742	R21	9001	I15
0020	D12	3114	L17	3743	T21	9110	L19
0030	B14	3117	J14	3744	Q20	9401	E28
0035	C13	3120	I13	3745	S20	9408	C24
0045	K19	3118	K16	3752	Q26	9423	C26
0041	Q27	3125	L14	3753	R26	9425	D26
0201	D6	3126	L14	3754	R25	9501	B14
0202	D12	3123	L18	3756	T27	9502	C14
0325	L29	3124	L17	3757	R30	9503	C14
0393	J25	3127	L14	3758	R30	9504	B14
0390	M29	3406	F22	3762	R31	9620	K27
0680	M1	3407	F23	3763	W30		
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1003	D15	3440	O23	3795	W23		
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1501	B12	3441	N24	3789	Q31		
1503	B15	3442	N25	3796	V27		
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2102	K13	3445	N27	3966	D7		
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2422	G27	3495	F25	4620	U14		
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2507	Q2	3530	F15	4681	R14		
2488	B26	3531	E15	4707	R31		
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2489	H28	3529	E19	4709	S32		
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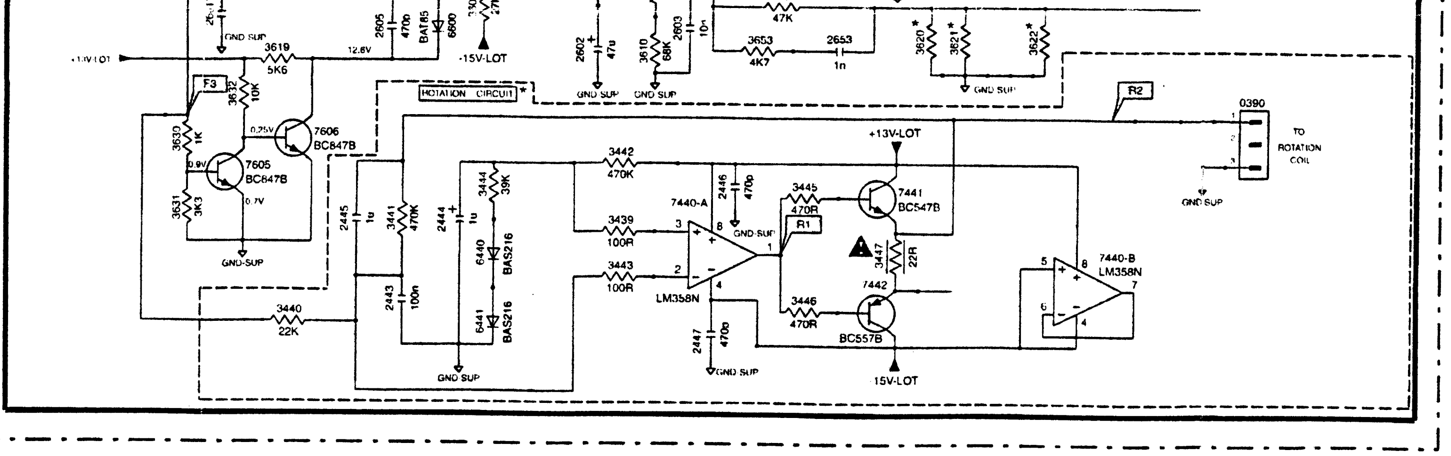
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68K
2603
10n
GND SUP
47K
3653
4K7
2653
1n
3620*
3621*
3622*
F3
3632
10K
ROTATION CIRCUIT*
R2
0390
TO ROTATION COIL
3630
1K
0.25V
7606
BC847B
0.9V
7605
BC847B
0.7V
3631
3K3
GND-SUP
3442
470K
+13V-LOT
3444
39K
2446
470p
3445
470R
7441
BC547B
2445
1u
3441
470K
2444
1u
3439
100R
7440-A
GND-SUP
R1
6440
BAS216
3447
22R
7440-B
LM358N
3443
100R
LM358N
7442
3440
22K
2443
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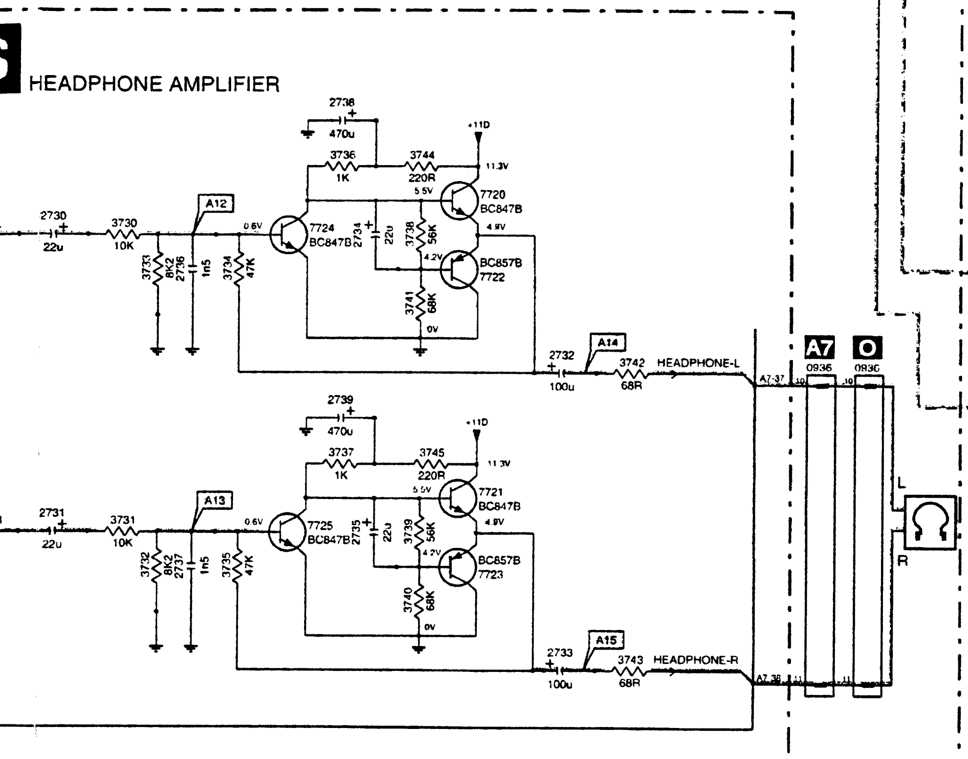
GND SUP
15V-LOT

NON-PROTECTION ERROR

HEADPHONE AMPLIFIER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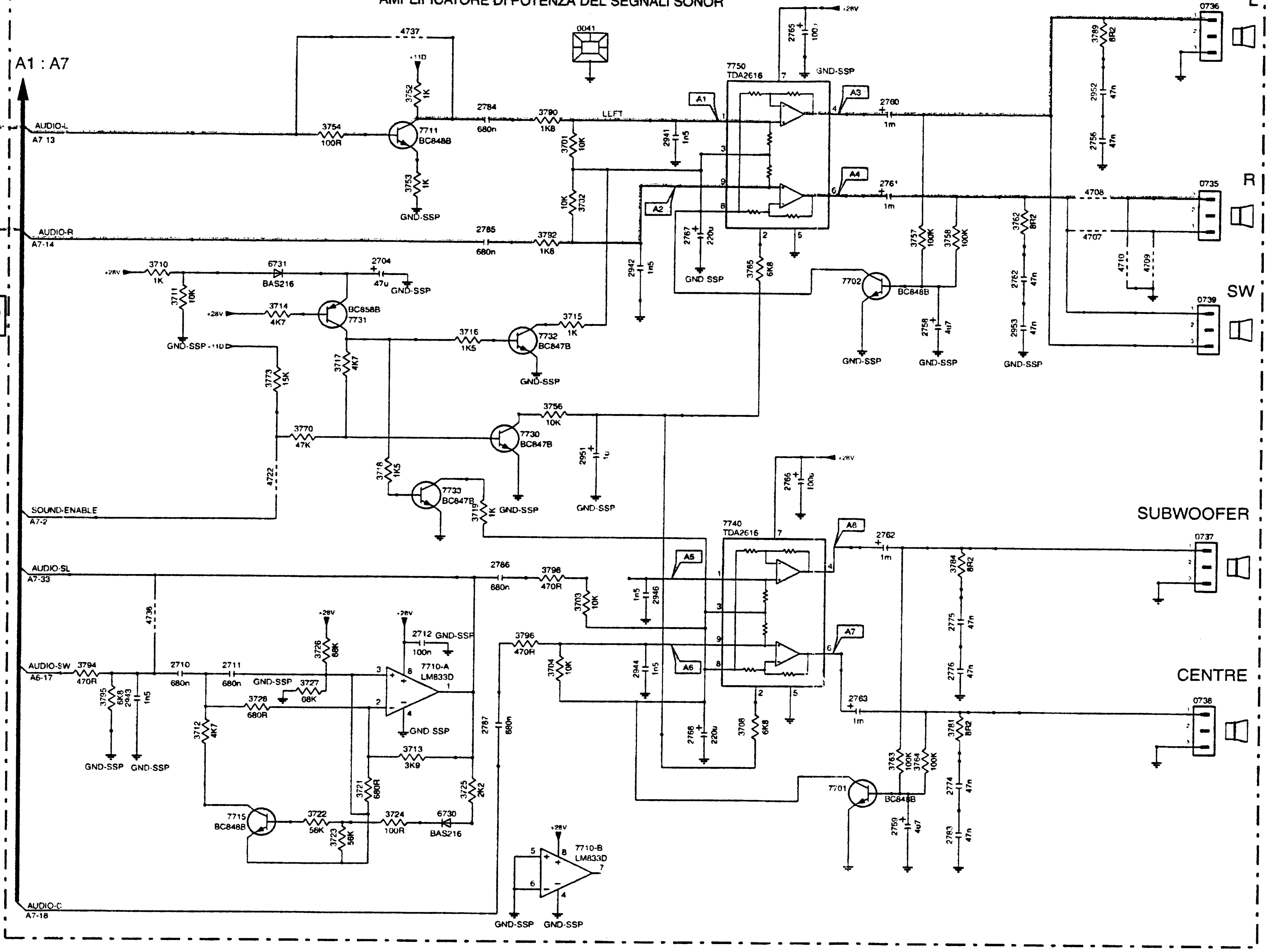
10K
A12
0.6V
7724
BC847B
2734
22u
3738
56K
4.9V
4.2V
BC857B
7722
3733
8K2
2736
1n5
3734
47K
3741
68K
0V
2732
100u
A14
3742
68R
HEADPHONE-L
A7-37
A7
0936
O
0930
2739
470u
+11D
3737
1K
3745
220R
11.3V
5.5V
7721
BC847B
2731
22u
3731
10K
A13
0.6V
7725
BC847B
2735
22u
3739
56K
4.9V
4.2V
BC857B
7723
3732
8K2
2737
1n5
3735
47K
3740
68K
0V
2733
100u
A15
3743
68R
HEADPHONE-R
A7-38
L
R

A5 AUDIO AMPLIFIER

SOUND POWER AMPLIFIER
GELUID-EINDVERSTERKER
AMPLIFICATEUR FINAL AUDIO
TONSIGNAL-ENDVERSTAERKER
AMPLIFICADOR FINAL DE AUDIO
AMPLIFICATORE DI POTENZA DEL SEGNALI SONOR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AUDIO-R
A7-14
SOUND-ENABLE
A7-2
AUDIO-SL
A7-33
AUDIO-SW
A6-17
AUDIO-C
A7-18
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+11D
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3754
100R
7711
BC848B
3753
1K
GND-SSP
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680n
3790
1K8
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10K
3732
10K
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100K
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BC848B
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7733
BC847B
3719
1K
SUBWOOFER
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2766
100u
7740
TDA2616
A5
A6
A7
A8
2762
1m
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8R2
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47n
2776
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CENTRE
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2783
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100K
3764
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680R
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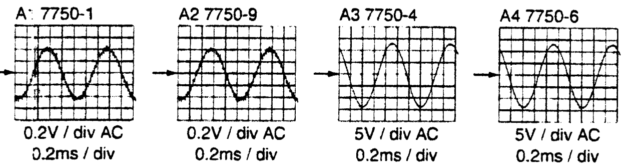

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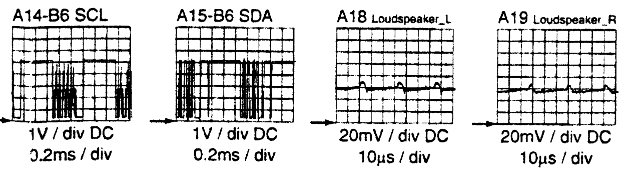

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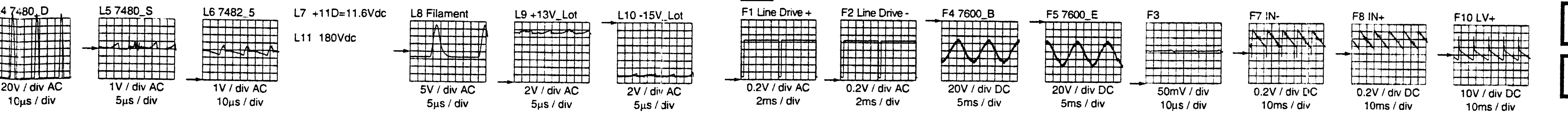

3122 785 00240

CHASSIS EM2E

CL 96532156_091.eps
140400

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2547	S13	3605	M25	3106	K15
2548	T14	3616	T14	6109	J14
2549	W14	3625	M5	6107	J18
2609	O9	3606	L25	6111	I18
2610	W10	3607	L25	6120	L18
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2600	K23	3621	N12	6122	L18
2601	M23	3611	J23	6406	F22
2602	M25	3609	M26	6407	D23
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2605	M24	3610	M26	6405	J28
2604	L26	3612	K25	6421	B26
2610	K25	3613	K25	6422	C26
2632	M5	3614	K24	6440	N25
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2639	M9	3617	K26	6480	E25
2622	J27	3620	M27	6482	G23
2636	O13	3621	M28	6481	F27
2640	M9	3623	M26	6483	J28
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2624	L28	3637	O12	6502	B14
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2641	T13	3638	P13	6504	C14
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2627	L28	3651	U1	6506	C15
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2653	P3	3652	T1	6507	B18
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2656	T4	3632	M23	6514	C17
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2657	T5	3654	U1	6517	F16
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2661	U2	3643	U13	6521	D18
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2731	S18	3690	W1	7529	F15
2732	R21	3679	U13	7528	E19
2733	T21	3680	M12	7600	K23
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2735	S20	3692	Q1	7603	K24
2736	R19	3693	Q1	7605	N23
2737	T19	3694	Q1	7606	N24
2738	Q19	3695	R1	7610	L22
2739	S19	3683	S14	7611	L22
2756	R31	3696	Q10	7652-A	S12
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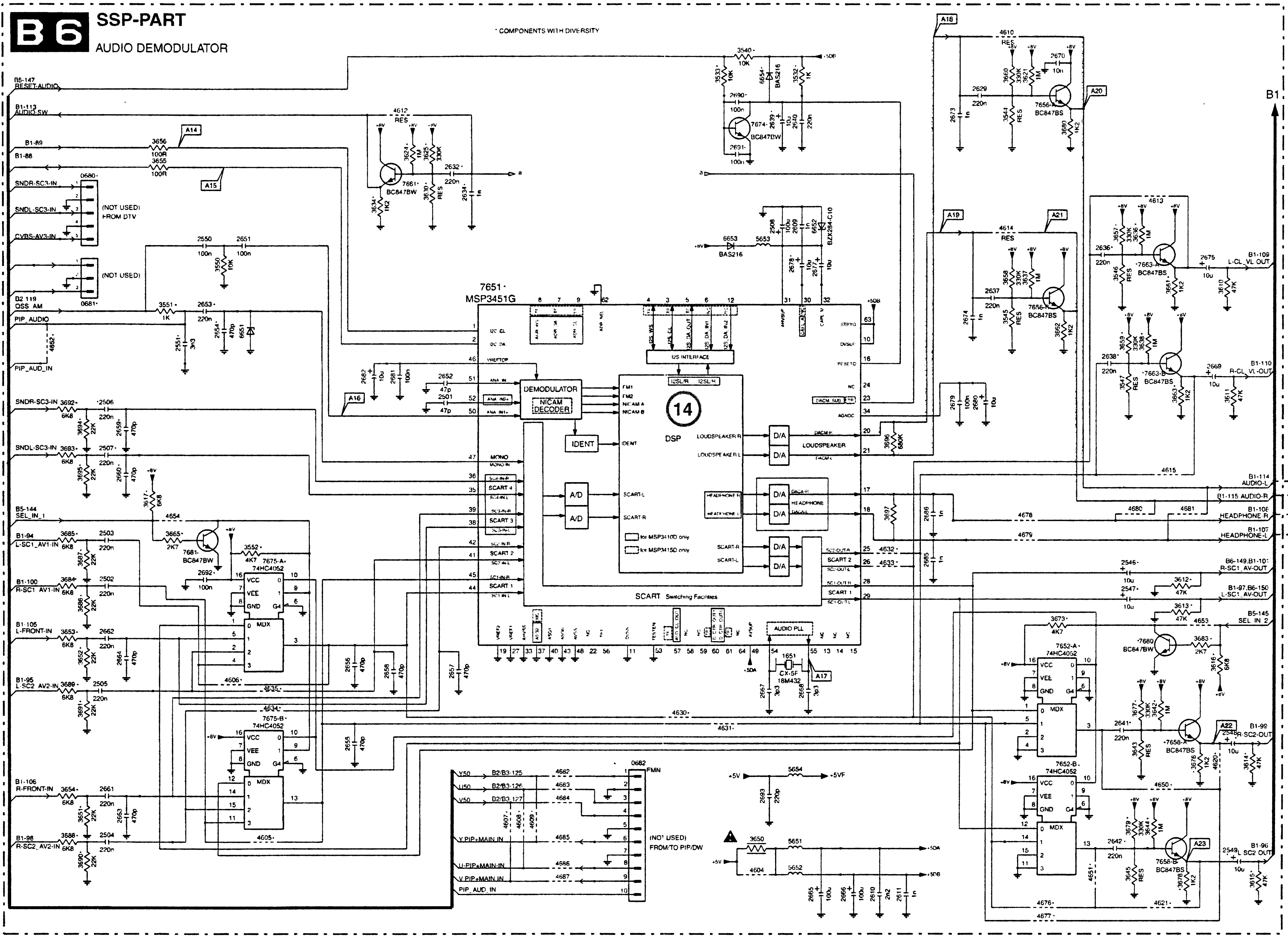
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SSP-PART
AUDIO DEMODULATOR
* COMPONENTS WITH DIVERSITY
7651*
MSP3451G
DEMODULATOR
NICAM DECODER
IDENT
DSP
14
A/D
D/A
I2S INTERFACE
LOUDSPEAKER
HEADPHONE
SCART Switching Facilities
AUDIO PLL
for MSP3410D only
for MSP3415D only
B5-147 RESET-AUDIO
B1-113 AUDIO-SW
B1-89
B1-88
SNDR-SC3-IN
SNDL-SC3-IN
CVBS-AV3-IN
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PIP_AUDIO
PIP_AUD_IN
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B1-100 R-SC1_AV1-IN
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B1-95 L-SC2_AV2-IN
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B1-96 R-SC2_AV2-IN
7675-A 74HC4052
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7658-B BC847BS
6653 BAS216
6654 BAS216
6652 BZX284-C10
1651 CX-5F 18M432
0680
0681
0682 FMN
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U50 B2/B3-126
V50 B2/B3-127
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U-PIP+MAIN-IN
V-PIP+MAIN-IN
PIP_AUD_IN
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B1-109 L-CL_VL OUT
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B1-115 AUDIO-R
B1-108 HEADPHONE-R
B1-107 HEADPHONE-L
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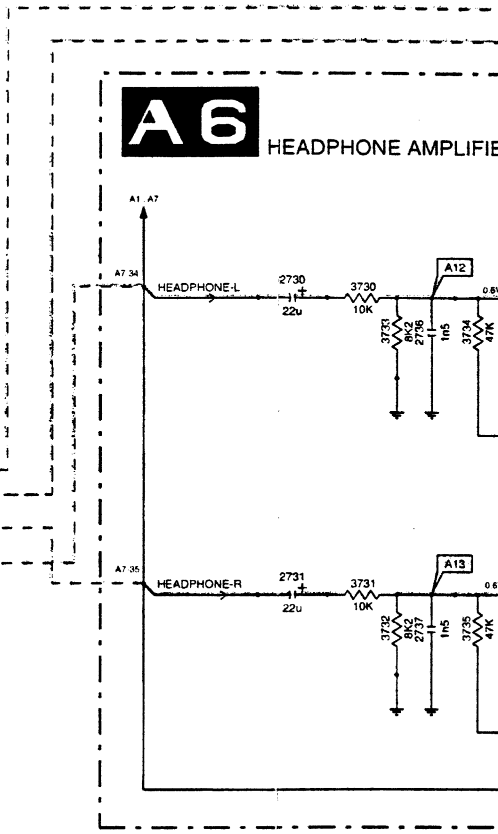
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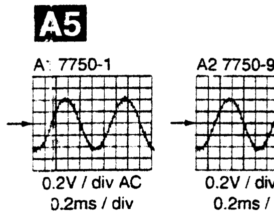
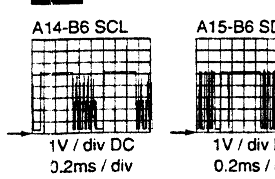
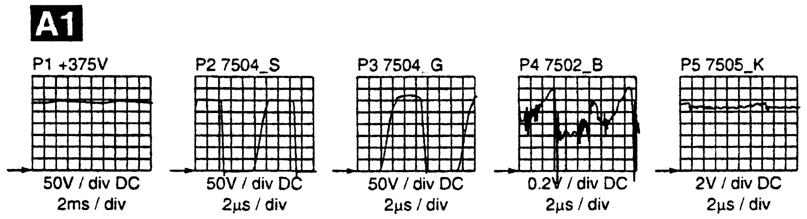
10K

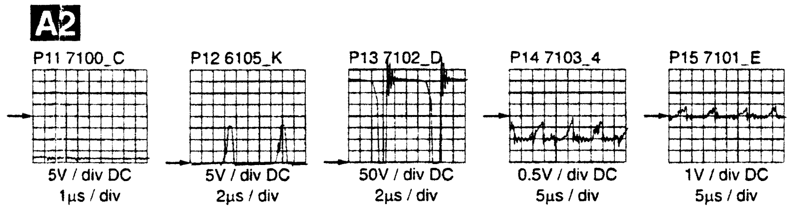




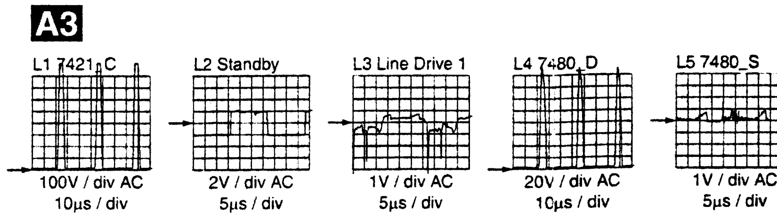


P6 VBATT=140Vdc

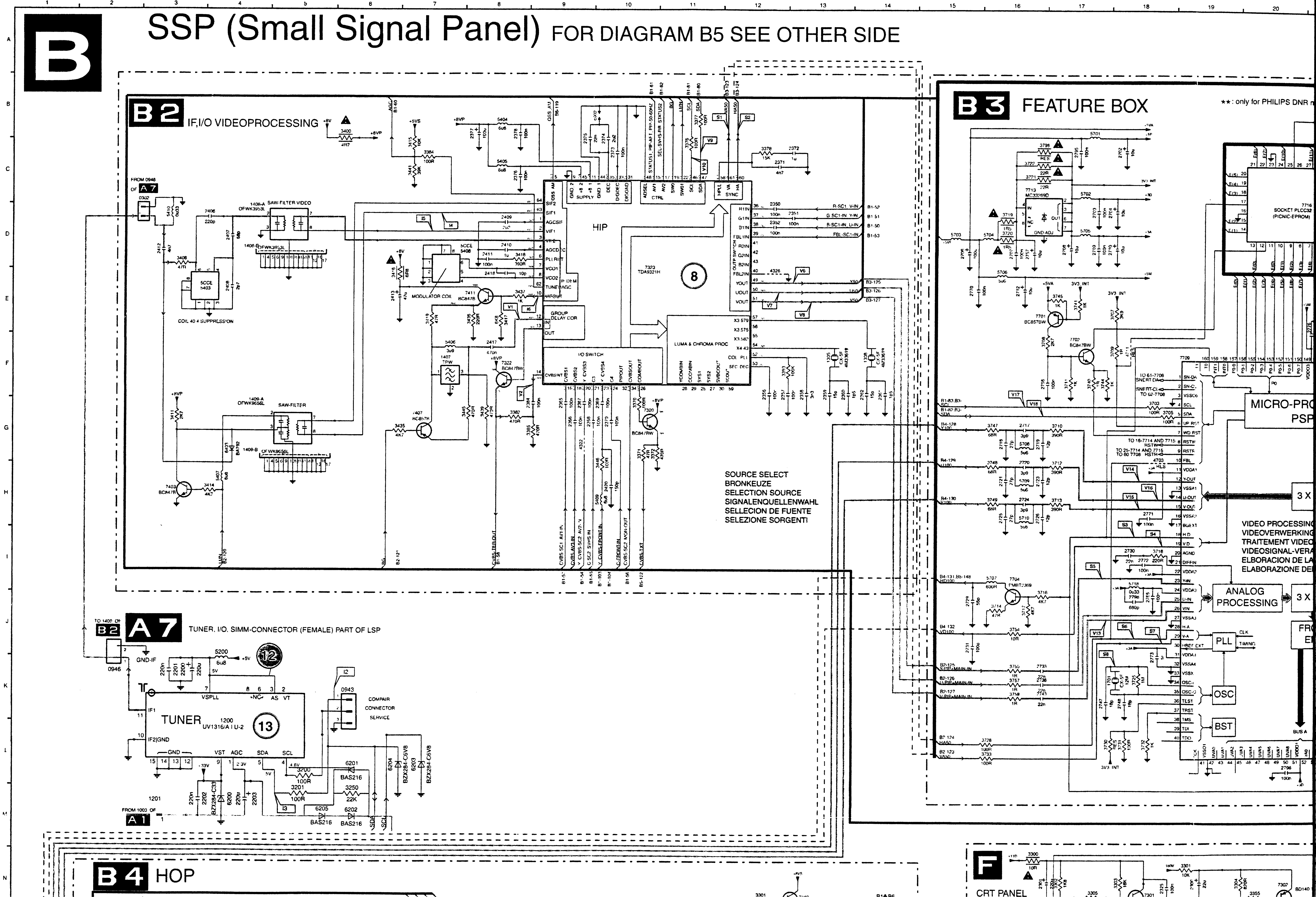
P7 Sound Supply =33Vdc

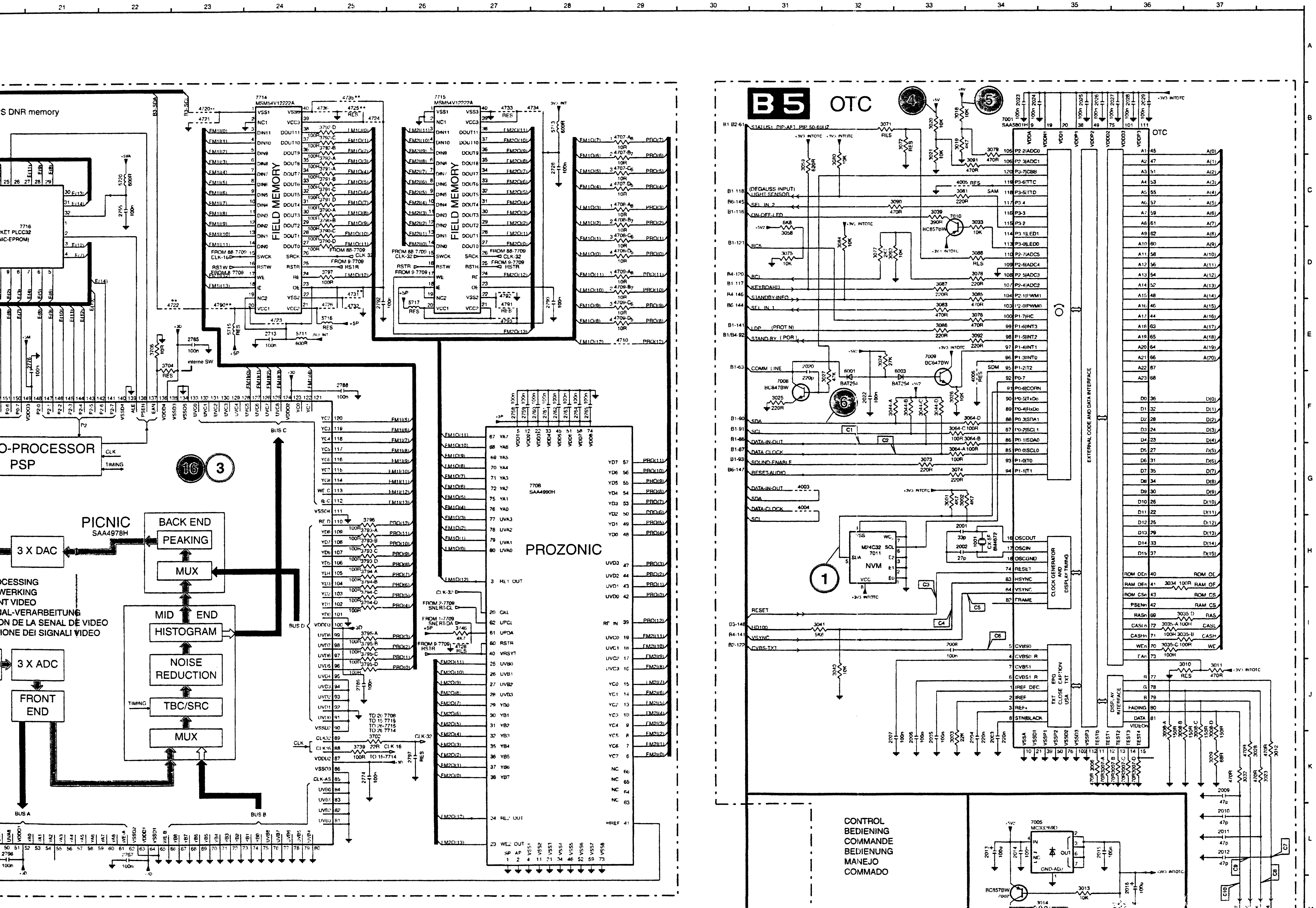


P16 5.2V



B SSP (Small Signal Panel) FOR DIAGRAM B5 SEE OTHER SIDE


B2 IF,I/O VIDEOPROCESSING
FROM 0946 OF A7
SAW-FILTER VIDEO
COIL 40 4 SUPPRESSION
MODULATOR COIL
SAW-FILTER
HIP
7323 TDA9321H
8
GROUP DELAY COR
I/O SWITCH
LUMA & CHROMA PROC
SUPPLY
CTRL
SYNC
SOURCE SELECT
BRONKEUZE
SELECTION SOURCE
SIGNALENQUELLENWAHL
SELLECION DE FUENTE
SELEZIONE SORGENTI
B3 FEATURE BOX
**: only for PHILIPS DNR
7716 SOCKET PLCC32 (PICNIC-EPROM)
7713 MC33269D
MICRO-PROCESSOR PSP
VIDEO PROCESSING
VIDEOVERWERKING
TRAITEMENT VIDEO
VIDEOSIGNAL-VERA
ELBORACION DE LA
ELABORAZIONE DE
ANALOG PROCESSING
PLL
OSC
BST
3 X
BUS A
TO 1400 OF B2
A7 TUNER, I/O, SIMM-CONNECTOR (FEMALE) PART OF LSP
TUNER 1200 UV1316/A I U-2
12
13
COMPAIR CONNECTOR SERVICE
FROM 1003 OF A1
B4 HOP
F CRT PANEL


21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
36
37
S DNR memory
7714 MSM54V12222A
FIELD MEMORY
7715 MSM54V12222A
FIELD MEMORY
7716
O-PROCESSOR
PSP
16
3
PICNIC
SAA4978H
BACK END
PEAKING
MUX
MID END
HISTOGRAM
NOISE REDUCTION
TBC/SRC
MUX
3 X DAC
3 X ADC
FRONT END
OCESSING
WERKING
NT VIDEO
AL-VERARBEITUNG
ON DE LA SENAL DE VIDEO
IONE DEI SIGNALI VIDEO
BUS A
BUS B
BUS C
BUS D
7706
SAA4990H
PROZONIC
B5
OTC
4
5
6
1
7001
SAA5801H
OTC
EXTERNAL CODE AND DATA INTERFACE
CLOCK GENERATOR AND DISPLAY TIMING
TXT EPG CLOSE CAPTION USA
DISPLAY INTERFACE
M24C32
7011
NVM
CONTROL
BEDIENING
COMMANDE
BEDIENUNG
MANEJO
COMMADO
7005
MC33269D
STATUS1 (PIP-AF1 PIP 50-60HZ)
(DEGAUSS INPUT) LIGHT SENSOR
SEL IN 2
ON-OFF-LED
RC5
BCL
KEYBOARD
STANDBY-INFO
SEL IN 1
LDP (PROT N)
STAND-BY (POR)
COMM LINE
SDA
SCL
DATA-IN-OUT
DATA CLOCK
SOUND-ENABLE
RESET-AUDIO
RESET
HD100
VSYNC
CVBS-TXT

c001	T11	3001	G34	3706	E22
c002	B9	3002	G34	3707	E18
0031	R20	3003	K34	3708	F16
0224	R16	3006	K36	3709	F18
0235	N21	3007-A	K36	3710	G17
0298-A	R23	3007-B	K37	3711	F17
0298-B	R23	3007-C	K37	3712	G17
0298-C	P21	3007-D	K37	3713	H17
0298-D	P21	3008-A	J37	3714	J16
0298-E	P21	3008-B	J37	3716	I16
0298-F	Q21	3008-C	J37	3717	J16
0298-G	Q21	3008-D	J37	3718	I18
0298-H	R21	3009	K37	3719	D16
0298-I	R24	3010	J37	3720	D16
0298-K	R24	3011	J37	3721	C16
0302	C1	3012	K37	3722	C16
0334	S25	3013	M35	3725	K18
0340	O16	3014	M35	3728	L16
0383	O21	3015	M34	3730	L17
1001	H35	3016	M35	3731	L18
1301	T5	3017	M36	3732	L18
1305	F12	3018	B34	3733	L16
1308	F13	3019	B34	3739	K25
1407	F6	3020	B34	3740	F17
1408-A	C3	3021	B34	3741	E17
1408-B	D3	3023	K37	3744	F17
1409-A	F3	3024	E33	3745	E17
1409-B	G3	3025	F32	3746	I27
1701	K18	3026	F34	3747	G16
2001	H34	3027	F33	3748	G16
2002	H34	3028	K37	3749	H16
2003	K35	3029	R34	3754	J16
2004	K35	3030	R34	3755	K16
2005	K34	3031	Q34	3757	K16
2006	K34	3032	K35	3759	K16
2007	K33	3033	C35	3790-A	C25
2008	I34	3034	H37	3790-B	C25
2009	K37	3035-A	I37	3790-C	D25
2010	K37	3035-B	I37	3790-D	D25
2011	K37	3035-C	I37	3791-A	C25
2012	K37	3035-D	I38	3791-B	C25
2013	L34	3039	C34	3791-C	C25
2014	L34	3040	J33	3791-D	C25
2015	L35	3041	I32	3792-A	C25
2016	M36	3044-A	F33	3792-B	B25
2017	M34	3044-B	F34	3792-C	B25
2019	S36	3044-C	F34	3792-D	B25
2020	E32	3044-D	F34	3793-A	H25
2022	F33	3058	D32	3793-B	H25
2023	B35	3059	C32	3793-C	H25
2024	B35	3060	D33	3793-D	H25
2025	B36	3061	R34	3794-A	H25
2026	B36	3062	N36	3794-B	H25
2027	B37	3064-A	G34	3794-C	I25
2028	B37	3064-B	F35	3794-D	I25
2029	B37	3064-C	F34	3795-A	I25
2031	N35	3064-D	F35	3795-B	I25
2032	S35	3071	B33	3795-C	I25
2033	U32	3072	B34	3795-D	J25
2034	U33	3073	G34	3796	H25
2035	U33	3074	G34	3797	D25
2036	U33	3075	D32	3798	C16
2037	U33	3076	E35	4002	E39
2038	R35	3077	D33	4003	G32
2300	V11	3078	D35	4004	G32
2300	N19	3079	B35	4005	C34
2301	N16	3080	C33	4006	F35
2302	N17	3081	C34	4301	P4
2303	R9	3083	E34	4306	T4
2303	N19	3084	D33	4310	R11
2304	T8	3085	D35	4311	S13
2304	N19	3086	E34	4322	G8
2305	T8	3087	D34	4326	E11
2305	O17	3088	D35	4703	G18
2306	U10	3090	C34	4707-A	B29
2306	O17	3091	C35	4707-B	B29
2307	R4	3092	E35	4707-C	C29
2307	O19	3300	U11	4707-D	C29
2308	S9	3300	N16	4708-A	C29
2308	P17	3301	N12	4708-B	C29
2309	Q4	3301	N19	4708-C	D29
2309	P19	3302	N17	4708-D	D29
2310	Q4	3303	N18	4709-A	D29
2310	P17	3304	U12	4709-B	D29
2311	U6	3304	N20	4709-C	E29
2312	Q17	3305	N17	4709-D	E29
2313	S9	3306	R9	4710	E29
2313	R17	3306	N18	4711	F18
2314	R3	3307	R10	4720	B23
2315	R3	3307	O17	4721	B23
2315	O16	3308	R10	4722	E23
2316	R17	3308	O20	4723	E24
2317	R4	3309	R12	4724	B25
2317	S24	3309	O19	4725	B25
2318	R4	3310	Q9	4726	E25
2318	R22	3310	O21	4728	I27
2319	T3	3311	T8	4731	D25
2320	U4	3311	O17	4732	E25
2320	R18	3312	T8	4733	B27
2321	P4	3312	O18	4734	B28
2321	Q17	3313	U9	4735	B25
2322	P4	3313	O18	4736	B25
2322	R17	3314	T8	4790	E23
2323	O4	3314	O18	4791	E27
2323	R17	3315	S9	4792	D27
2324	T7	3315	O17	4793	E27
2324	S24	3316	U10	5300	O20
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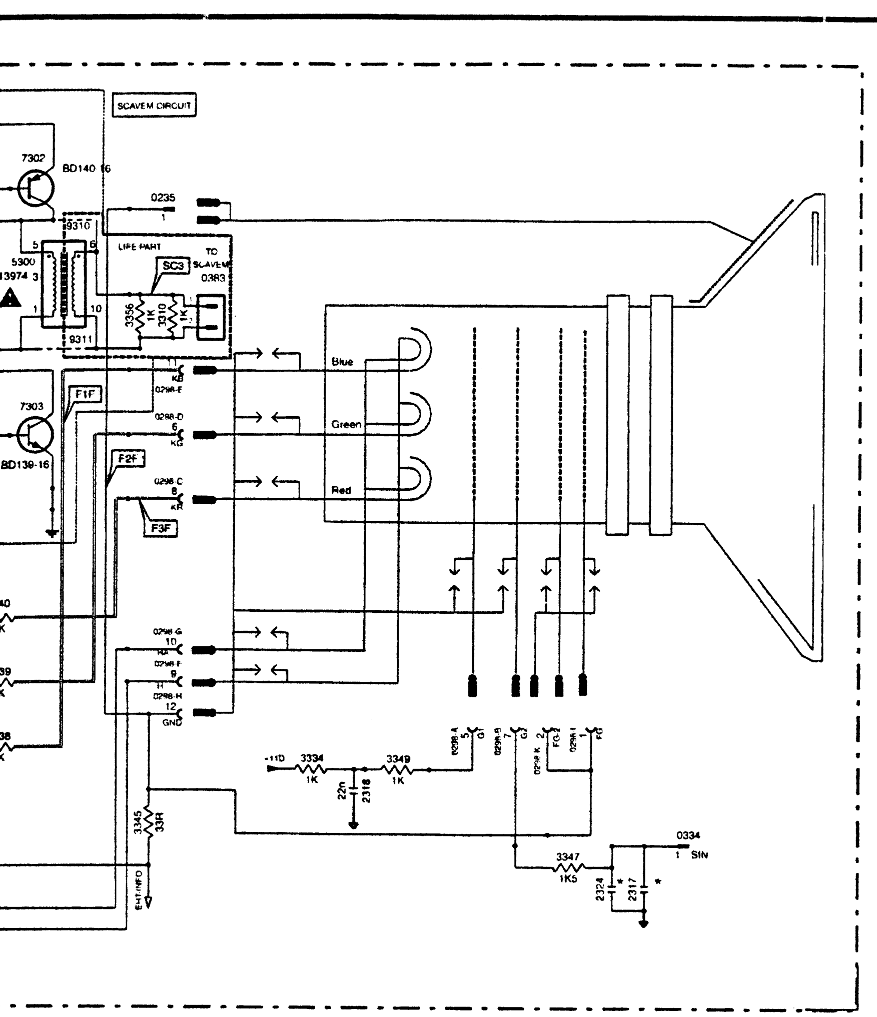
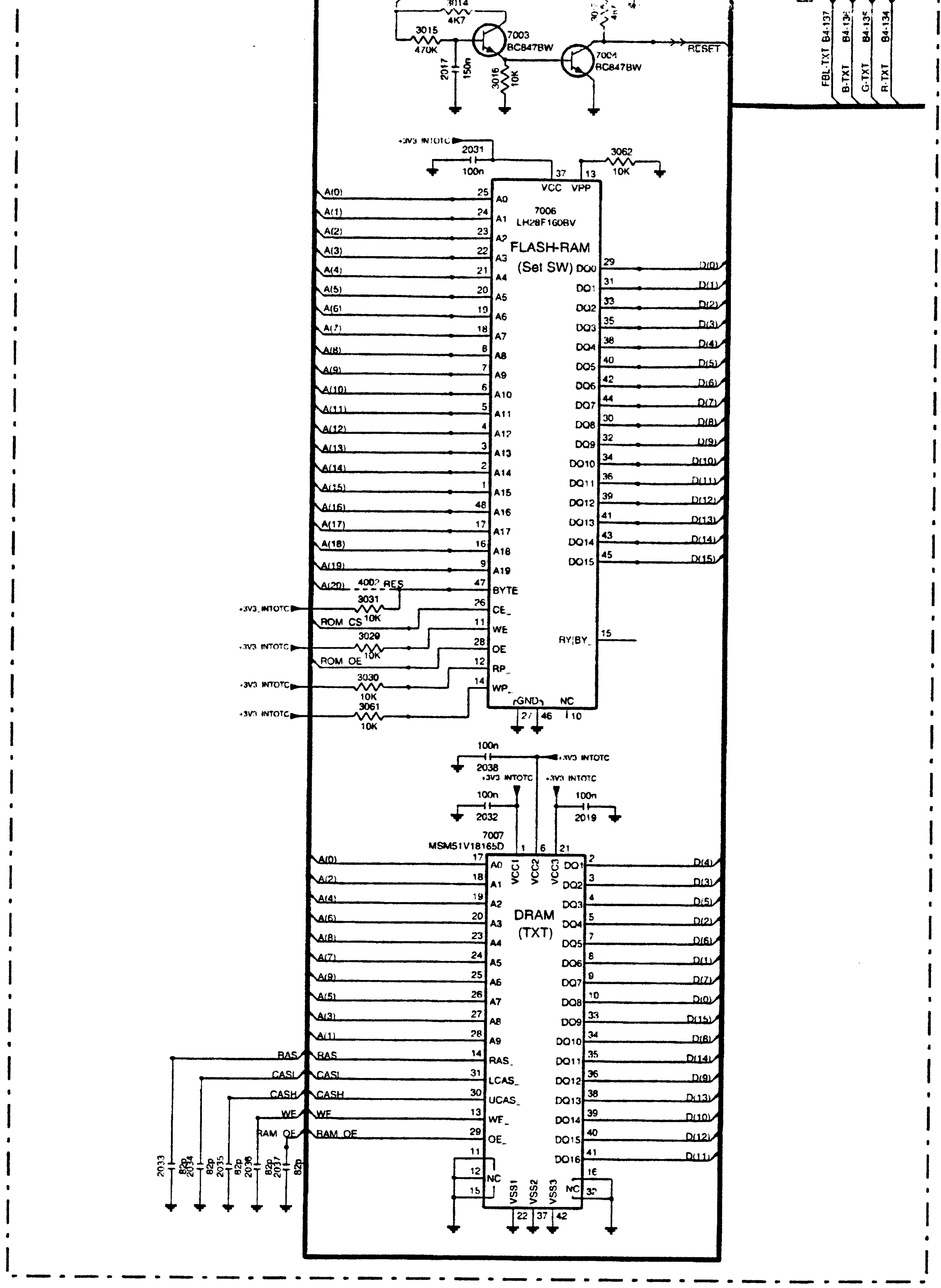


Diversity Tables

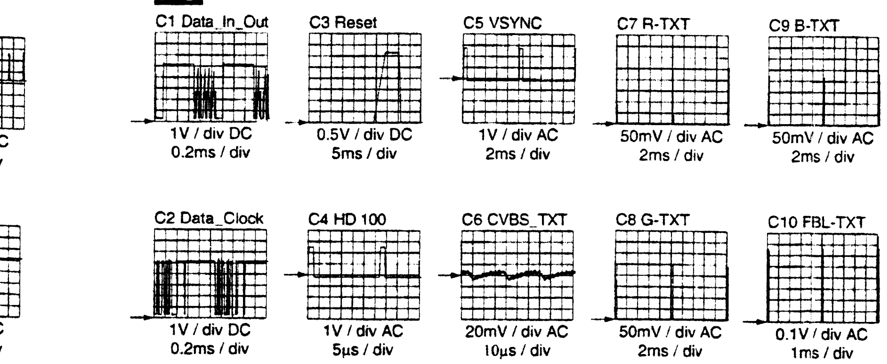
Diversity CRT-Panel (F)					
PosNr	29"	25"	28"	28" WS	32" WS
0298	-	-	-	-	SOC 9P
0298	CON 8P	CON 8P	CON 8P	CON 8P	-
0383	CON 02P	-	-	CON 02P	CON 02P
2300	22U	-	-	22U	22U
2301	220U	-	-	220U	220U
2302	3P3	-	-	3P3	3P3
2303	470P	-	-	470P	470P
2304	22N	-	-	22N	22N
2305	47U	-	-	47U	47U
2306	100N	-	-	100N	100N
2307	22N	-	-	22N	22N
2308	15P	-	-	15P	15P
2309	22N	-	-	22N	22N
2310	18P	-	-	18P	18P
2312	22P	-	-	22P	22P
2317	4N7	4N7	4N7	4N7	-
2317	4N7	4N7	4N7	4N7	-
2321	-	68P	68P	-	-
2322	-	82P	82P	-	-
2323	-	56P	56P	-	-
2324	-	-	-	-	820P
2325	100N	-	-	100N	100N
3300	FUSE 10R	-	-	FUSE 10R	FUSE 10R
3301	3W 10K	-	-	3W 10K	3W 10K
3302	1K8	-	-	1K8	1K8
3303	18K	-	-	18K	18K
3304	820R	-	-	820R	820R
3305	330R	-	-	330R	330R
3306	4R7	-	-	4R7	4R7
3307	10R	-	-	10R	10R
3308	56K	-	-	56K	56K
3309	150R	-	-	150R	150R
3310	1K	-	-	1K	1K
3311	100R	-	-	100R	100R
3312	2K2	-	-	2K2	2K2
3313	220R	-	-	220R	220R
3314	220R	-	-	220R	220R
3315	1K5	-	-	1K5	1K5
3316	56K	-	-	56K	56K
3317	1K2	-	-	1K2	1K2
3318	15R	-	-	15R	15R
3319	820R	-	-	820R	820R
3320	1K	-	-	1K	1K
3335	100R	-	-	100R	100R
3335	-	1K	1K	-	-
3336	100R	-	-	100R	100R
3336	-	1K	1K	-	-
3337	100R	-	-	100R	100R
3337	-	1K	1K	-	-
3355	4R7	-	-	4R7	4R7
3356	1K	-	-	1K	1K
3357	4R7	-	-	4R7	4R7
5300	TFM	-	-	TFM	TFM
7300	SIGF199	-	-	SIGF199	SIGF199
7301	SIGF370	-	-	SIGF370	SIGF370
7302	TRA POW	-	-	TRA POW	TRA POW
7303	TRA POW	-	-	TRA POW	TRA POW
9305	WR	-	-	WR	WR
9308	WR	-	-	WR	WR
9309	WR	-	-	WR	WR
9312	WR	-	-	WR	WR
9313	WR	-	-	WR	WR
9424	-	-	-	-	WR

Diversity Small Signal Panel (B3)			
Item	100HZ INCR ST	DS VIRT DLB	100HZ DLB
2728	-	100N	-
2758	-	100N	-
2759	-	100N	-
2760	-	100N	-
2761	-	100N	-
2762	-	100N	-
2763	-	100N	-
2764	-	100N	-
2765	-	100N	-
2790	-	100N	-
3793	10R	100R	10R
3794	10R	100R	10R
3795	10R	100R	10R
3796	10R	100R	10R
4707	10R	-	10R
4708	10R	-	10R
4709	10R	-	10R
4710	JUMP	-	JUMP
4734	-	JUMP	-
4792	-	JUMP	-
4793	-	JUMP	-
5713	-	FXDIND	-
7708	-	SAA4990H	-
7715	-	MSM54V12222A-30JS	-

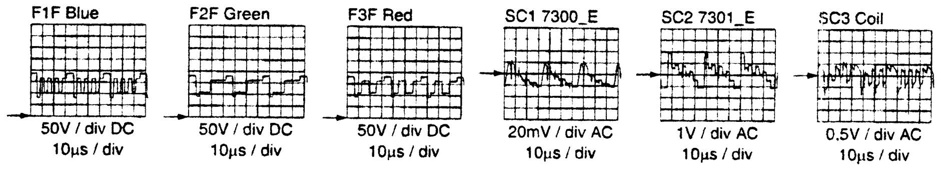


	[illegible]	[illegible]	3316	P20	5301	R3
M	2325	N18	3317	S10	5302	R3
	2328	O8	3317	P17	5403	E2
	2329	O7	3318	S9	5404	B7
	2330	O7	3318	P19	5405	C7
	2331	O7	3319	S5	5406	F6
	2332	R3	3319	P20	5407	H3
	2333	Q11	3320	Q3	5408	D6
	2334	Q9	3320	P17	5409	H9
N	2335	T7	3321	Q3	5410	D2
	2336	Q9	3322	Q13	5701	B17
	2338	S3	3322	O16	5702	C17
	2339	R11	3323	U6	5703	D15
	2340	V12	3324	U5	5704	D16
	2341	R2	3325	T6	5705	D17
	2350	D11	3326	T6	5706	E16
	2351	D12	3327	T6	5707	I16
	2352	D11	3328	R9	5708	G16
O	2356	F11	3329	R2	5709	H16
	2357	F11	3330	T3	5710	H16
	2358	F12	3331	U4	5711	E24
	2359	F12	3332	T3	5713	B28
	2360	F12	3333	U4	5715	E23
	2361	F13	3334	U5	5716	E25
	2362	F13	3334	R22	5717	E26
	2365	G8	3335	T7	5718	I18
P	2366	G8	3335	Q17	5720	C22
	2367	G8	3336	S6	6001	F33
	2368	G8	3336	R17	6003	F34
	2369	G9	3337	T6	6301	R11
	2370	G9	3337	Q17	6302	T8
	2371	C11	3338	T7	6303	U9
	2372	C12	3338	R20	6304	U10
	2373	C9	3339	Q20	6305	T5
	2374	B9	3340	O10	6305	Q20
Q	2375	B8	3340	Q20	6306	U6
	2376	C7	3341	O10	6306	Q20
	2377	B7	3341	R17	6307	U6
	2378	B7	3342	P10	6307	R19
	2384	G8	3342	Q17	6309	Q12
	2395	P4	3343	P12	6310	Q11
	2396	P3	3343	R16	6310	R18
	2397	P4	3344	Q11	6311	Q12
	2398	S6	3345	P9	6315	S13
R	2406	D3	3345	R21	6317	R13
	2407	D3	3346	P9	6318	R12
	2408	E3	3347	P9	6319	O9
	2409	D7	3347	S24	6320	P10
	2410	D7	3348	P10	6321	P9
	2411	D7	3348	R16	6334	U5
	2412	D2	3349	P11	6403	G3
	2413	E5	3349	R23	7001	B35
S	2417	F7	3350	P11	7002	M34
	2418	E7	3350	Q19	7003	M35
	2420	H9	3351	Q19	7004	M35
	2702	C18	3352	R19	7005	L34
	2703	D17	3354	R19	7006	N35
	2704	D15	3355	N20	7007	S35
	2706	D15	3356	O21	7008	F32
	2707	D16	3357	P20	7009	E34
	2708	D17	3362	S3	7010	C34
T	2709	D17	3363	S4	7011	H33
	2710	D18	3364	S3	7300	N17
	2712	E16	3365	S2	7301	O4
	2713	E24	3366	S10	7301	N18
	2717	G16	3367	R10	7302	N20
	2718	G16	3368	R10	7303	T9
	2719	G16	3369	S10	7303	P20
	2720	G16	3370	G9	7306	P11
	2721	H16	3371	G9	7307	Q18
U	2723	H16	3372	G9	7308	U7
	2724	H16	3376	C10	7309	S4
	2725	H16	3377	B10	7310	S12
	2726	H16	3378	C11	7311	S2
	2728	C28	3382	G7	7312	Q10
	2729	J15	3384	C6	7320	G9
	2730	I18	3385	G8	7322	F7
	2731	J15	3386	S12	7323	D9
V	2733	K16	3387	S13	7324	T7
	2738	K16	3388	Q11	7330	T3
	2743	K16	3389	Q10	7340	N13
	2747	K17	3390	Q10	7403	H2
	2748	K18	3391	S12	7407	G6
	2755	C22	3392	R11	7411	E7
	2756	F16	3393	F11	7701	E16
	2757	D16	3394	Q9	7702	F17
	2758	F27	3395	P4	7704	I16
W	2759	F27	3396	P3	7708	G27
	2760	F28	3397	P3	7709	F19
	2761	F28	3398	P3	7713	C16
	2762	F28	3399	O13	7714	B24
	2763	F28	3400	B5	7715	B26
	2764	F28	3406	D2	7716	C21
	2765	F28	3411	G2	9310	N20
	2766	J18	3414	H3	9311	O21
	2767	L22	3415	C6		
X	2770	E15	3416	E5		
	2771	H18	3417	E7		
	2772	I18	3418	D7		
	2773	J18	3419	E6		
	2774	K25	3435	G6		
	2776	E21	3436	E7		
	2785	E23	3437	E7		
	2786	J25	3439	G7		
Y	2788	F25	3441	C6		
	2790	E28	3445	G7		
	2792	E25	3446	G9		
	2795	C17	3702	K25		
	2796	L20	3703	G18		
	2797	K26	3704	E22		
	2798	J18	3705	G18		

B5



F



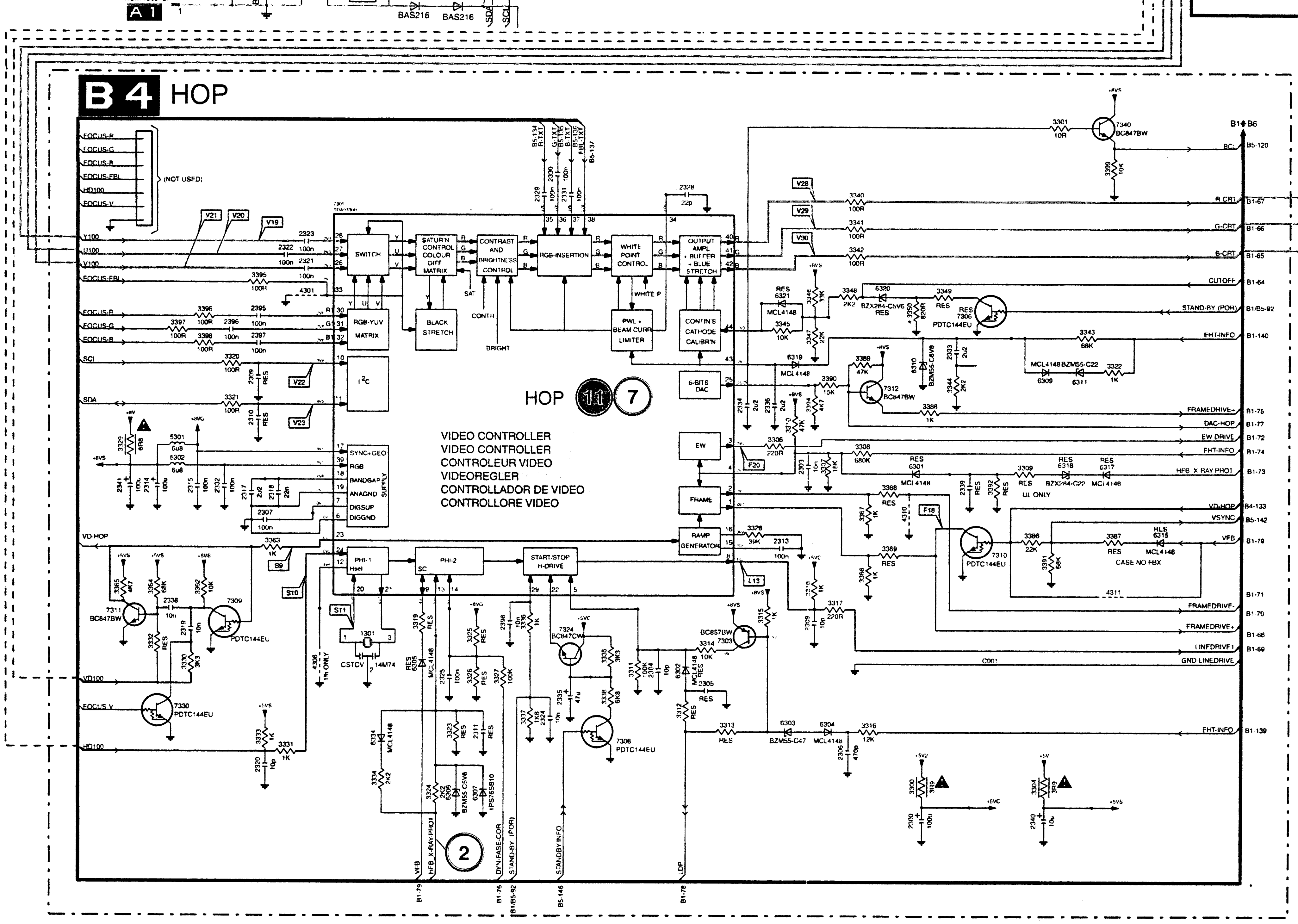
—— IF, CVAS, RGB

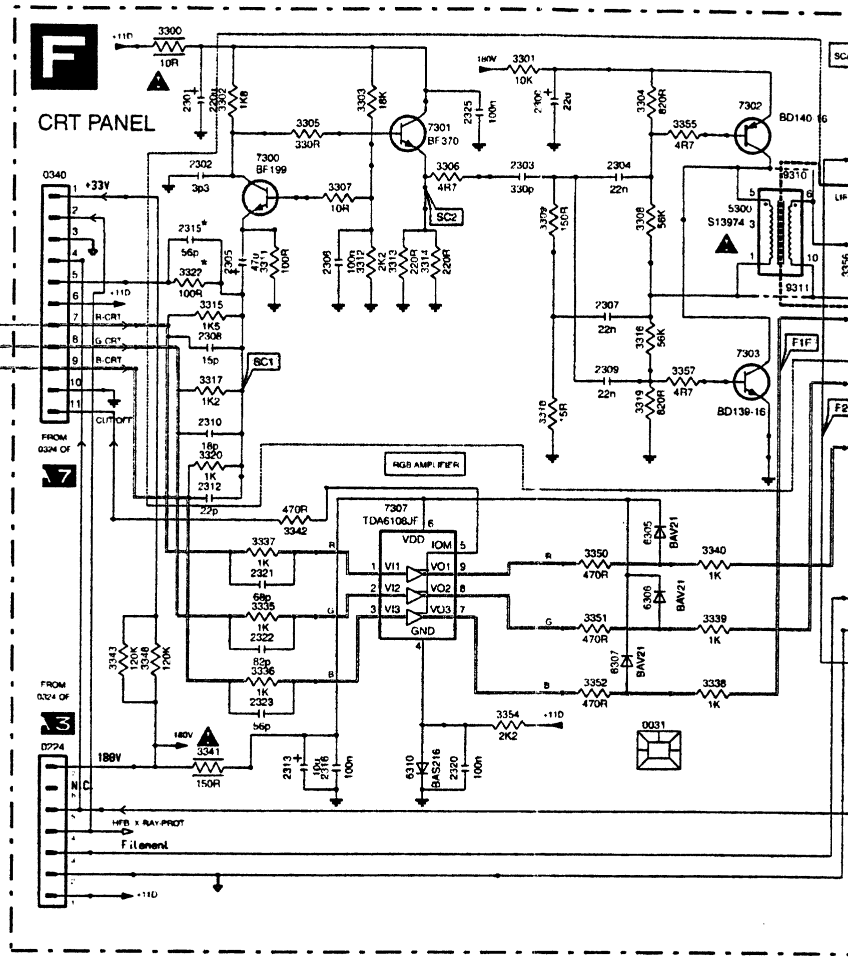
● PROTECTION ERROR

○ NON-PROTECTION ERROR

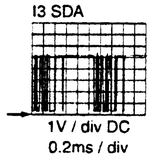
CL 96532156_092.eps
140400

0119b_zw-F1

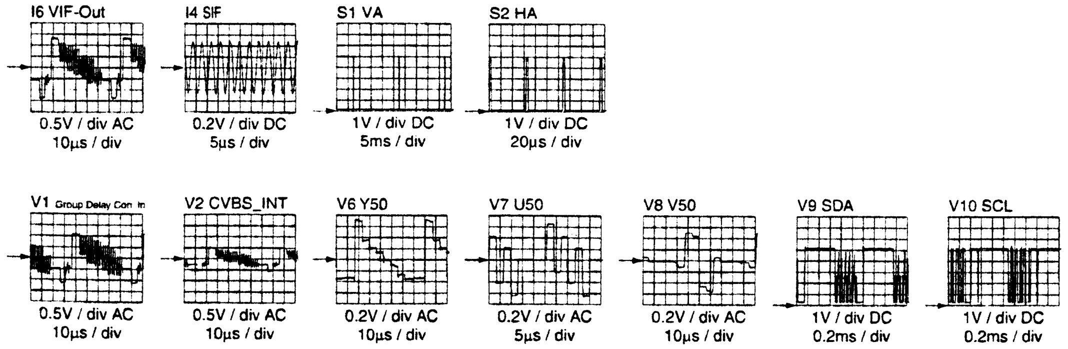

A1
BAS216
BAS216
SDA
SCL
B4 HOP
FOCUS-R
FOCUS-G
FOCUS-B
FOCUS-FBL
HD100
FOCUS-V
(NOT USED)
Y100
U100
V100
FOCUS-FBL
FOCUS-R
FOCUS-G
FOCUS-B
SCL
SDA
VD-HOP
VD100
FOCUS-V
HD100
V19
V20
V21
V22
V23
V28
V29
V30
SWITCH
SATUR'N CONTROL COLOUR DIFF MATRIX
CONTRAST AND BRIGHTNESS CONTROL
RGB-INSERTION
WHITE POINT CONTROL
OUTPUT AMPL + BUFFER + BLUE STRETCH
RGB-YUV MATRIX
BLACK STRETCH
PWL + BEAM CURR LIMITER
CONTIN'S CATHODE CALIBR'N
I²C
6-BITS DAC
EW
FRAME
RAMP GENERATOR
SYNC+GEO
RGB
BANDGAP
ANAGND
DIGSUP
DIGGND
SUPPLY
PHI-1 Hsel
PHI-2 SC
START/STOP H-DRIVE
SAT
CONTR
BRIGHT
WHITE P
HOP 11 7
VIDEO CONTROLLER
VIDEO CONTROLLER
CONTROLEUR VIDEO
VIDEOREGLER
CONTROLLADOR DE VIDEO
CONTROLLORE VIDEO
B5-134 R-TXT
G-TXT
B-TXT
B5-136 FBL-TXT
B5-137
7340 BC847BW
7312 BC847BW
7306 PDTC144EU
7310 PDTC144EU
7311 BC847BW
7309 PDTC144EU
7330 PDTC144EU
7324 BC847CW
7308 PDTC144EU
7303 BC857BW
1301 CSTCV 14M74
S9
S10
S11
F18
F20
L13
UL ONLY
CASE NO FBX
B1÷B6
BC B5-120
R-CRT B1-67
G-CRT B1-66
B-CRT B1-65
CUTOFF B1-64
STAND-BY (POR) B1/B5-92
EHT-INFO B1-140
FRAMEDRIVE- B1-75
DAC-HOP B1-77
EW DRIVE B1-72
EHT-INFO B1-74
HFB X-RAY PROT B1-73
VD-HOP B4-133
VSYNC B5-142
VFB B1-79
B1-71
FRAMEDRIVE- B1-70
FRAMEDRIVE+ B1-68
LINEDRIVE1 B1-69
GND LINEDRIVE
EHT-INFO B1-139
VFB B1-79
HFB X-RAY PROT
2
DYN FASE COR B1-76
STAND-BY (POR) B1/B5-92
STANDBY INFO B5-146
LDP B1-78


F
CRT PANEL
7300 BF199
7301 BF370
7302 BD140-16
7303 BD139-16
7307 TDA6108JF
RGB AMPLIFIER
5300 S13974
9310
9311
SC1
SC2
F1F
0340
+33V
R-CRT
G-CRT
B-CRT
CUTOFF
FROM 0324 OF
7
FROM 0324 OF
3
0224
180V
HFB + X-RAY-PROT
Filament
+11D
VDD
IOM
VI1
VI2
VI3
VO1
VO2
VO3
GND
BAV21
BAS216
0031

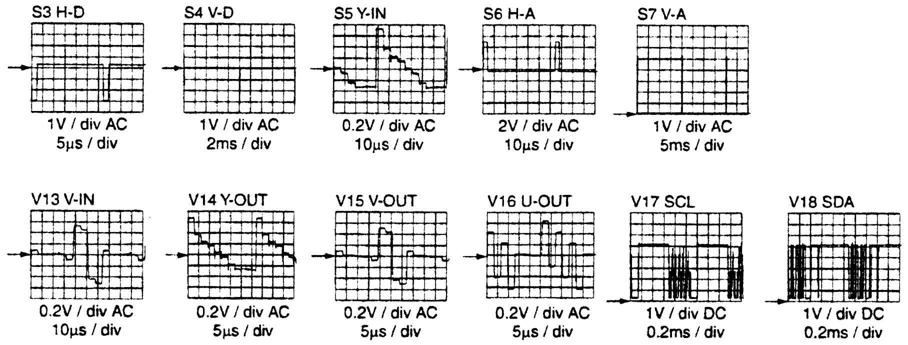
A7


I3 SDA
1V / div DC
0.2ms / div

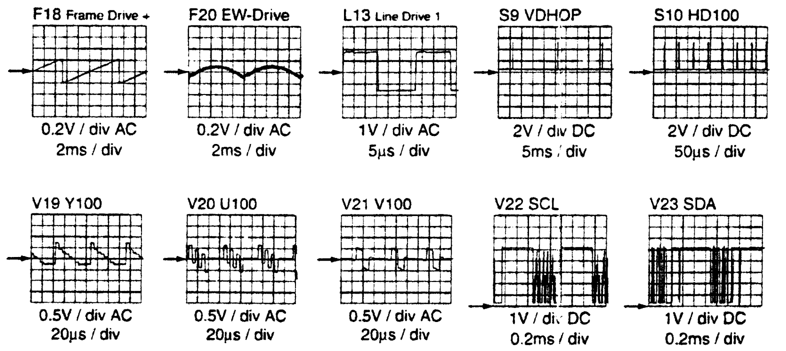
B2


I6 VIF-Out
0.5V / div AC
10µs / div
I4 SIF
0.2V / div DC
5µs / div
S1 VA
1V / div DC
5ms / div
S2 HA
1V / div DC
20µs / div
V1 Group Delay Con In
0.5V / div AC
10µs / div
V2 CVBS_INT
0.5V / div AC
10µs / div
V6 Y50
0.2V / div AC
10µs / div
V7 U50
0.2V / div AC
5µs / div
V8 V50
0.2V / div AC
10µs / div
V9 SDA
1V / div DC
0.2ms / div
V10 SCL
1V / div DC
0.2ms / div

B3


S3 H-D
1V / div AC
5µs / div
S4 V-D
1V / div AC
2ms / div
S5 Y-IN
0.2V / div AC
10µs / div
S6 H-A
2V / div AC
10µs / div
S7 V-A
1V / div AC
5ms / div
V13 V-IN
0.2V / div AC
10µs / div
V14 Y-OUT
0.2V / div AC
5µs / div
V15 V-OUT
0.2V / div AC
5µs / div
V16 U-OUT
0.2V / div AC
5µs / div
V17 SCL
1V / div DC
0.2ms / div
V18 SDA
1V / div DC
0.2ms / div

B4


F18 Frame Drive +
0.2V / div AC
2ms / div
F20 EW-Drive
0.2V / div AC
2ms / div
L13 Line Drive 1
1V / div AC
5µs / div
S9 VDHOP
2V / div DC
5ms / div
S10 HD100
2V / div DC
50µs / div
V19 Y100
0.5V / div AC
20µs / div
V20 U100
0.5V / div AC
20µs / div
V21 V100
0.5V / div AC
20µs / div
V22 SCL
1V / div DC
0.2ms / div
V23 SDA
1V / div DC
0.2ms / div

Colour Television

Chassis

EM2E

AA 02.01

Service
Service
Service

Service Information

(GB) Changes in Course of Production

INTRODUCTION ANTI-MOIRÉ PANEL
From production start onwards, an anti-moiré panel was introduced in the 29" 4:3 Real Flat sets with Philips CRT. This anti-moiré circuitry is combined with the DC-shift panel (assy 12nc is 3104 328 16661).

Involved sets:
- 29PT9007.
- 29PT9047.

Circuit diagram (G), layouts and partslist are published.

INTRODUCTION OF NEW SSB PANEL
During production, a new SSB panel is introduced. The layout of the copper pattern has been changed to version 8. Below, you will find the most important changes.

Diagram B4 (HOP):
- A new dimensioning of the HOP slow-start circuit (items 3335, 3338 and 2335).
- A new flash circuit (items 6313 and 6314 are added) around the HOP (diagram B4).

Diagram B5 (OTC):
- A new flash reset circuitry is added, to prevent NVM overwriting.
- To solve TXT-jitter, two transistors (7012 and 7013) were added, to improve the steepness of the H_{SYNC} and V_{SYNC} pulses. This change is implemented together with new software.

Circuit diagrams (B4 and B5), layouts and partslist are published.

(D) Änderungen bei der Produktion

EINFÜHRUNG DES ANTI-MOIRÉ-PANELS
Seit Beginn der Produktion enthalten die 29" 4:3 Real Flat Geräte mit Philips Kathodenstrahlröhre ein Anti-Moiré Panel. Diese Anti-Moiré Schaltung wird mit dem Gleichstromänderungs-Panel (Assy 12nc ist 3104 328 16661) kombiniert.

Betroffene Geräte:
- 29PT9007.
- 29PT9047.

Der Schaltplan (G), die Layouts und die Teileliste wurden veröffentlicht.

EINFÜHRUNG DES NEUEN SSB-PANELS
Während der Produktion wird das neue Klein Signal Platine (SSB-Panel) eingeführt. Das Layout der Kupferstruktur wurde zu Version 8 geändert. Nachstehend werden die wichtigsten Änderungen beschrieben

Schaltplan B4 (HOP):
- Eine neue Dimension von HOP Slow Start Schaltungen (Teile 3335, 3338 und 2335).
- Eine neue Flash-Schaltung um den HOP (Teile 6313 und 6314 werden hinzugefügt). (Schaltplan B4)

Schaltplan B5 (OTC):
- Es wird eine neue Rückstell Schaltung für den Flash-Speicher hinzugefügt, um das Überschreiben des nicht-flüchtigen Speichers zu verhindern.
- Um TXT-Bildschwankungen zu beheben, wurden zur Verbesserung der Steilheit der Impulse HSYNC und VSYNC zwei Transistoren (7012 und 7013) hinzugefügt. Diese Änderung wird zusammen mit neuer Software implementiert.

Die Schaltpläne (B4 und B5), die Layouts und die Teileliste wurden veröffentlicht.

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Published by JA 0262 Service PaCE Printed in the Netherlands Subject to modification 3122 785 40590

PHILIPS

Ⓕ Modifications en cours de production

INTRODUCTION D’UNE PLATINE ANTI-MOIRÉ
Une platine anti-moiré a été introduite dans les postes 4:3 Real Flat de 29" équipés d’un tube cathodique Philips depuis le début de la production. Ce circuit anti-moiré est combiné à la platine à décalage CC réglable (réf. 12nc 3104 328 16661).

Postes concernés :
- 29PT9007.
- 29PT9047.

Les schémas de câblage, tracés et listes de pièces correspondants sont publiés.

INTRODUCTION D’UNE NOUVELLE PLATINE PETITS SIGNAUX
Une nouvelle platine petits signaux (SSB) a été introduite au cours de la production. Le tracé des pistes de cuivre a été modifié et correspond maintenant à la version 8. Les plus importantes modifications sont notées ci-dessous.

Schéma B4 (HOP)
- Le circuit HOP à démarrage lent a été redimensionné (éléments 3335, 3338 et 2335).
- Un nouveau circuit flash (les éléments 6313 et 6314 ont été ajoutés) a été disposé autour du processeur HOP (schéma B4).

Schéma B5 (OTC)
- Un nouveau circuit de réinitialisation flash a été ajouté afin d’empêcher l’écrasement de la mémoire non volatile (NVM).
- Pour résoudre le problème d’instabilité horizontale de l’image texte, deux transistors (7012 et 7013) ont été ajoutés afin d’améliorer la raideur des impulsions HSYNC et VSYNC. Cette modification est mise en œuvre conjointement avec le nouveau logiciel.

Les schémas de câblage (B4 et B5), tracés et listes de pièces correspondants sont publiés.

Ⓔ Cambios durante la producción

INTRODUCCIÓN DEL PANEL ANTI-MOIRÉ
Desde que se ha iniciado la producción, se ha introducido un panel anti-moiré en los equipos de 29" 4:3 Real Flat con TRC de Philips. Esta circuitería anti-moiré se combina con el panel de desplazamiento de C.C. (el código 12NC del conjunto es 3104 328 16661).

Equipos implicados:
- 29PT9007.
- 29PT9047.

Se publican el diagrama de circuitos (G), esquemas y listas de piezas.

INTRODUCCIÓN DEL NUEVO PANEL SSB
Durante la producción, se ha introducido un nuevo panel SSB. El esquema del patrón de pistas de cobre ha cambiado a la versión 8. A continuación encontrará los cambios más importantes.

Diagrama B4 (HOP):
- Nuevo dimensionamiento de la circuitería de arranque lento del HOP (elementos 3335, 3338 y 2335).
- Nuevo circuito flash (se agregan los elementos 6313 y 6314) alrededor del HOP (diagrama B4).

Diagrama B5 (OTC):
- Se ha agregado una nueva circuitería flash de reset para evitar la sobrescritura de la NVM.
- Para solucionar el problema del temblor (jitter) de TXT, se han agregado dos transistores (7012 y 7013) para mejorar la pendiente de los pulsos HSYNC y VSYNC. Este cambio se ha implantado conjuntamente con el nuevo software.

Se publican los diagramas (B4 y B5), esquemas y listas de piezas.

I Modifiche in corso di produzione

INRODUZIONE DI UN PANNELLO ANTI-MOIRÉ
A partire dalla produzione in poi, è stato introdotto un pannello anti-moiré negli apparecchi 29" 4:3 Real Flat con CRT Philips. Questo circuito anti-moiré è associato ad un pannello di deviazione in C.C. (l'assemblaggio 12nc è 3104 328 16661).

Apparecchi interessati:
- 29PT9007.
- 29PT9047.

Schemi dei circuiti (G), layout ed elenco parti di ricambio sono pubblicati.

INTRODUZIONE DEL NUOVO PANNELLO SSB
Durante la produzione, viene introdotto un nuovo pannello SSB. Il layout del modello in rame è stato cambiato nella versione 8. Qui di seguito vengono elencate le modifiche più importanti.

Schema B4 (HOP):
- Nuovo dimensionamento del circuito HOP ad avvio ritardato (art. 3335, 3338 e 2335).
- Nuovo circuito flash (aggiunti gli art. 6313 e 6314) attorno all' HOP (schema B4).

Schema B5 (OTC):
- È stato aggiunto un nuovo circuito di flash reset per impedire la sovrascrittura NVM.
- Per risolvere il tremolio TXT, sono stati aggiunti due transistori (7012 e 7013), in modo da migliorare la ripidezza degli impulsi HSYNC e VSYNC. Questa modifica è stata implementata assieme al nuovo software.

Schemi del circuiti (B4 e B5), layout ed elenco parti di ricambio sono pubblicati.

Spare Parts List

Small Signal Panel [B]

Various

0302	2422 025 16542	CON 2P Male
1001	2422 543 89022	XTL 6MHz 20pF
1301	2422 540 98456	CER RES 12MHz
1305	2422 543 01184	XTL 4M433619 20pF
1308	2422 543 01158	XTL 3M579545 7pF
1407	2422 549 44324	FIL CER 5M5/5M74
1408	2422 549 44372	FIL SAW 38.9MHz OFWK3953L
1409	2422 549 44369	FIL SAW 38.9MHz OFWK9656L
1651	2422 543 89019	XTL 18M432 12pF
1701	2422 543 89018	XTL 12MHz 20pF

⊣⊢

2001	2222 867 15339	33pF 5% 50V
2002	4822 126 11669	27pF
2003	4822 126 13879	220nF 20% 16V
2004	4822 126 13879	220nF 20% 16V
2005	4822 126 14305	100nF 10% 16V
2006	4822 126 14305	100nF 10% 16V
2007	4822 126 14305	100nF 10% 16V
2008	4822 126 14305	100nF 10% 16V
2010	4822 122 33777	47pF 5% 63V
2011	4822 122 33777	47pF 5% 63V
2012	4822 122 33777	47pF 5% 63V
2013	4822 124 12095	100µF 20% 16V
2014	4822 126 14305	100nF 10% 16V
2015	4822 126 14305	100nF 10% 16V
2016	2020 021 91557	100µF 20% 16V
2017	4822 126 14305	100nF 10% 16V
2019	4822 126 14305	100nF 10% 16V
2020	4822 126 13883	220pF 5% 50V
2022	4822 126 14305	100nF 10% 16V
2023	4822 126 14305	100nF 10% 16V
2024	4822 126 14305	100nF 10% 16V
2025	4822 126 14305	100nF 10% 16V
2026	4822 126 14305	100nF 10% 16V
2027	4822 126 14305	100nF 10% 16V
2028	4822 126 14305	100nF 10% 16V
2029	4822 126 14305	100nF 10% 16V
2031	4822 126 14305	100nF 10% 16V
2032	4822 126 14305	100nF 10% 16V
2033	4822 126 14226	82pF 5% 50V
2034	4822 126 14226	82pF 5% 50V
2035	4822 126 14226	82pF 5% 50V
2036	4822 126 14226	82pF 5% 50V
2037	4822 126 14226	82pF 5% 50V
2038	4822 126 14305	100nF 10% 16V
2039	4822 126 14305	100nF 10% 16V
2300	4822 124 12095	100µF 20% 16V
2303	5322 126 11583	10nF 10% 50V
2304	4822 122 33741	10pF 10% 50V
2306	4822 126 13881	470pF 5% 50V
2307	4822 126 14305	100nF 10% 16V
2308	4822 122 33741	10pF 10% 50V
2313	4822 121 70159	0.1µF 16V
2314	4822 124 12095	100µF 20% 16V
2315	4822 126 14305	100nF 10% 16V
2317	4822 126 14491	2.2µF 10V
2318	4822 126 14494	22nF 10% 25V
2319	5322 126 11583	10nF 10% 50V
2320	4822 122 33741	10pF 10% 50V
2321	4822 126 14305	100nF 10% 16V
2322	4822 126 14305	100nF 10% 16V
2323	4822 126 14305	100nF 10% 16V
2324	5322 126 11583	10nF 10% 50V
2325	4822 126 14305	100nF 10% 16V
2328	4822 122 33761	22pF 5% 50V
2329	4822 126 14305	100nF 10% 16V
2330	4822 126 14305	100nF 10% 16V
2331	4822 126 14305	100nF 10% 16V
2332	4822 126 14305	100nF 10% 16V
2333	4822 126 14491	2.2µF 10V
2334	4822 126 14491	2.2µF 10V
2335	4822 124 12095	100µF 20% 16V
2336	4822 126 14491	2.2µF 10V
2338	5322 126 11583	10nF 10% 50V
2340	4822 124 23002	10µF 16V
2341	4822 124 12095	100µF 20% 16V
2350	4822 126 14305	100nF 10% 16V
2351	4822 126 14305	100nF 10% 16V
2352	4822 126 14305	100nF 10% 16V
2356	4822 126 14305	100nF 10% 16V
2357	4822 126 14305	100nF 10% 16V
2358	5322 126 11579	3.3nF 10% 63V
2359	4822 122 33752	15pF 5% 50V
2360	3198 016 33380	3.3pF 50V
2361	3198 016 31580	1.5pF 50V
2362	4822 126 11663	12pF
2365	4822 126 14305	100nF 10% 16V
2366	4822 126 14305	100nF 10% 16V
2367	4822 126 14305	100nF 10% 16V
2368	4822 126 14305	100nF 10% 16V
2369	4822 126 14305	100nF 10% 16V
2370	4822 126 14305	100nF 10% 16V
2371	4822 126 13193	4.7nF 10% 63V
2372	4822 126 14043	1µF 20% 16V
2373	4822 126 14305	100nF 10% 16V
2374	4822 126 14491	2.2µF 10V
2375	4822 126 14494	22nF 10% 25V
2376	4822 126 14305	100nF 10% 16V
2377	4822 124 12095	100µF 20% 16V
2378	4822 126 14305	100nF 10% 16V
2384	4822 126 14305	100nF 10% 16V
2406	4822 126 13883	220pF 5% 50V
2407	4822 126 13956	68pF 5% 63V
2408	3198 016 32780	2.7pF 50V
2409	4822 126 14491	2.2µF 10V
2410	4822 126 14472	1µF 10% 10V
2411	4822 126 14305	100nF 10% 16V
2412	4822 126 13193	4.7nF 10% 63V
2413	4822 124 80151	47µF 16V
2417	3198 017 44740	0603 10V 470nF
2418	4822 126 13956	68pF 5% 63V
2420	4822 122 33753	150pF 5% 50V
2501	4822 122 33777	47pF 5% 63V
2502	4822 122 32927	220nF 20% 50V
2503	4822 122 32927	220nF 20% 50V
2504	4822 122 32927	220nF 20% 50V
2505	4822 122 32927	220nF 20% 50V
2508	2020 021 91557	100µF 20% 16V
2546	4822 124 23002	10µF 16V
2547	4822 124 23002	10µF 16V
2548	4822 124 23002	10µF 16V
2549	4822 124 23002	10µF 16V
2550	4822 126 14241	330pF 50V
2551	5322 126 11579	3.3nF 10% 63V
2609	3198 016 31020	1nF 25V
2610	4822 126 14238	2.2nF 50V
2611	5322 126 11578	1nF 10% 50V
2629	4822 122 32927	220nF 20% 50V
2637	4822 122 32927	220nF 20% 50V
2640	4822 126 13879	220nF 20% 16V
2651	4822 126 14305	100nF 10% 16V
2652	4822 122 33777	47pF 5% 63V
2653	4822 122 32927	220nF 20% 50V
2654	4822 126 13881	470pF 5% 50V
2655	4822 126 13881	470pF 5% 50V
2656	4822 126 13881	470pF 5% 50V
2657	4822 126 13881	470pF 5% 50V
2658	4822 126 13881	470pF 5% 50V
2661	4822 122 32927	220nF 20% 50V
2662	4822 122 32927	220nF 20% 50V
2663	4822 126 13881	470pF 5% 50V
2664	4822 126 13881	470pF 5% 50V
2665	4822 124 12095	100µF 20% 16V
2666	4822 124 12095	100µF 20% 16V
2667	3198 016 33380	3.3pF 50V
2668	3198 016 33380	3.3pF 50V
2669	4822 124 23002	10µF 16V
2670	5322 126 11583	10nF 10% 50V
2673	3198 016 31020	1nF 25V
2674	3198 016 31020	1nF 25V
2675	4822 124 23002	10µF 16V
2677	2020 021 91554	10µF 20% 16V
2678	2020 021 91554	10µF 20% 16V
2679	4822 126 14305	100nF 10% 16V
2680	2020 021 91554	10µF 20% 16V
2681	4822 126 14305	100nF 10% 16V
2682	2020 021 91554	10µF 20% 16V
2685	3198 016 31020	0603 25V 1nF
2686	3198 016 31020	0603 25V 1nF
2690	4822 126 14305	100nF 10% 16V
2691	4822 126 14305	100nF 10% 16V
2693	4822 126 13883	220pF 5% 50V
2702	2020 021 91554	10µF 20% 16V
2703	4822 126 14305	100nF 10% 16V
2704	2020 021 91554	10µF 20% 16V
2706	2020 021 91557	100µF 20% 16V
2707	4822 126 14305	100nF 10% 16V
2708	2020 021 91554	10µF 20% 16V
2709	4822 126 14305	100nF 10% 16V
2710	2020 021 91554	10µF 20% 16V
2712	2020 021 91554	10µF 20% 16V
2713	4822 126 14305	100nF 10% 16V
2717	4822 126 14218	3.9pF 50V
2718	4822 126 11669	27pF
2719	4822 126 11663	12pF
2720	4822 126 14218	3.9pF 50V
2721	4822 126 11669	27pF
2723	4822 126 11663	12pF
2724	4822 126 14218	3.9pF 50V
2725	4822 126 11669	27pF
2726	4822 126 11663	12pF
2728	4822 126 14305	100nF 10% 16V
2729	4822 126 14225	56pF 5% 50V
2730	4822 126 14494	22nF 10% 25V
2731	4822 122 31765	100pF 2% 63V 1206
2733	4822 126 14494	22nF 10% 25V
2738	4822 126 14494	22nF 10% 25V
2743	4822 126 14494	22nF 10% 25V
2747	4822 126 14507	18pF 5% 50V
2748	4822 126 14507	18pF 5% 50V
2755	4822 126 14305	100nF 10% 16V
2756	4822 126 14305	100nF 10% 16V
2757	2020 021 91554	10µF 20% 16V
2758	4822 126 14305	100nF 10% 16V
2759	4822 126 14305	100nF 10% 16V
2760	4822 126 14305	100nF 10% 16V
2761	4822 126 14305	100nF 10% 16V
2762	4822 126 14305	100nF 10% 16V
2763	4822 126 14305	100nF 10% 16V
2764	4822 126 14305	100nF 10% 16V
2765	4822 126 14305	100nF 10% 16V
2766	4822 126 14305	100nF 10% 16V
2767	4822 126 14305	100nF 10% 16V
2770	4822 126 14305	100nF 10% 16V
2771	4822 126 14305	100nF 10% 16V
2772	4822 126 14305	100nF 10% 16V
2773	3198 016 31020	0603 25V 1nF
2774	4822 126 14305	100nF 10% 16V
2776	4822 126 14305	100nF 10% 16V
2785	4822 126 14305	100nF 10% 16V
2786	4822 126 14305	100nF 10% 16V
2788	4822 126 14305	100nF 10% 16V
2790	4822 126 14305	100nF 10% 16V
2792	4822 126 14305	100nF 10% 16V
2795	4822 126 14305	100nF 10% 16V
2796	4822 126 14305	100nF 10% 16V
2798	3198 016 36810	680pF 25V
2902	5322 126 11583	10nF 10% 50V
2908	4822 126 13883	220pF 5% 50V
2909	4822 126 13883	220pF 5% 50V
2910	4822 126 13883	220pF 5% 50V
2911	4822 126 13883	220pF 5% 50V
2912	4822 126 13883	220pF 5% 50V
2913	4822 126 13883	220pF 5% 50V
2914	4822 126 13883	220pF 5% 50V
2915	4822 126 13883	220pF 5% 50V
2916	4822 126 13883	220pF 5% 50V
2917	4822 126 13883	220pF 5% 50V

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3001	4822 051 30472	4k7 5% 0.062W
3002	4822 051 30472	4k7 5% 0.062W
3003	4822 117 13525	24k 1% 0.62W
3006	4822 051 30471	470Ω 5% 0.062W
3007	3198 031 14710	4 X 470Ω PM5
3008	4822 117 13526	150Ω 5% 0.63W
3009	4822 051 30689	68Ω 5% 0.063W
3011	4822 051 30471	470Ω 5% 0.062W
3012	4822 051 30101	100Ω 5% 0.062W
3013	4822 051 30103	10k 5% 0.062W
3014	4822 051 30682	6k8 5% 0.062W
3015	4822 051 30474	470k 5% 0.062W
3016	4822 051 30152	1k5 5% 0.062W
3017	4822 051 30472	4k7 5% 0.062W
3018	4822 051 30103	10k 5% 0.062W
3019	4822 051 30472	4k7 5% 0.062W
3020	4822 051 30103	10k 5% 0.062W
3021	4822 051 30103	10k 5% 0.062W
3023	4822 051 30101	100Ω 5% 0.062W
3024	4822 051 30273	27k 5% 0.062W
3025	4822 051 30221	220Ω 5% 0.062W
3026	4822 051 30103	10k 5% 0.062W
3027	4822 117 12925	47k 1% 0.063W
3028	4822 051 30101	100Ω 5% 0.062W
3029	4822 051 30103	10k 5% 0.062W
3030	4822 051 30101	100Ω 5% 0.062W
3031	4822 051 30103	10k 5% 0.062W

3032	4822 051 30101	100Ω 5% 0.062W
3033	4822 051 30103	10k 5% 0.062W
3034	4822 051 30101	100Ω 5% 0.062W
3035	3198 031 11010	4 X 100Ω PM5
3039	4822 051 30101	100Ω 5% 0.062W
3040	4822 051 30103	10k 5% 0.062W
3041	4822 051 30562	5k6 5% 0.062W
3044	3198 031 14720	4 X 4k7 PM5
3058	4822 051 30682	6k8 5% 0.062W
3059	2322 704 66201	620Ω PM1
3060	4822 051 30103	10k 5% 0.062W
3061	4822 051 30103	10k 5% 0.062W
3062	4822 051 30103	10k 5% 0.062W
3064	3198 031 11010	4 X 100Ω PM5
3073	4822 051 30471	470Ω 5% 0.062W
3074	4822 051 30471	470Ω 5% 0.062W
3075	4822 051 30103	10k 5% 0.062W
3076	4822 051 30471	470Ω 5% 0.062W
3077	4822 051 30272	2k7 5% 0.062W
3078	4822 051 30471	470Ω 5% 0.062W
3079	4822 051 30471	470Ω 5% 0.062W
3080	4822 051 30472	4k7 5% 0.062W
3081	4822 051 30471	470Ω 5% 0.062W
3083	4822 051 30471	470Ω 5% 0.062W
3084	4822 051 30103	10k 5% 0.062W
3085	4822 051 30471	470Ω 5% 0.062W
3086	4822 051 30471	470Ω 5% 0.062W
3087	4822 051 30471	470Ω 5% 0.062W
3088	4822 051 30471	470Ω 5% 0.062W
3089	4822 117 12925	47k 1% 0.063W
3090	4822 051 30471	470Ω 5% 0.062W
3091	4822 051 30471	470Ω 5% 0.062W
3092	4822 051 30221	220Ω 5% 0.062W
3095	4822 051 30008	0Ω jumper
3097	4822 051 30474	470k 5% 0.062W
3098	4822 051 30472	4k7 5% 0.062W
3099	4822 117 12925	47k 1% 0.063W
3300	2322 750 63908	3Ω9 PM5
3301	4822 051 30109	10Ω 5% 0.062W
3304	2322 750 63908	3Ω9 PM5
3306	4822 051 30221	220Ω 5% 0.062W
3307	4822 051 30183	18k 5% 0.062W
3308	4822 051 30684	680k 5% 0.062W
3310	4822 117 12925	47k 1% 0.063W
3311	4822 117 13632	100k 1% 0.62W
3314	4822 051 30103	10k 5% 0.062W
3315	4822 051 30102	1k 5% 0.062W
3316	4822 051 30123	12k 5% 0.062W
3317	4822 051 30221	220Ω 5% 0.062W
3318	4822 051 30102	1k 5% 0.062W
3320	4822 051 30101	100Ω 5% 0.062W
3321	4822 051 30101	100Ω 5% 0.062W
3322	4822 051 10102	1k 2% 0.25W
3324	4822 051 30222	2k2 5% 0.062W
3327	4822 117 13632	100k 1% 0.62W
3328	4822 051 30393	39k 5% 0.062W
3329	4822 117 13568	6Ω8 5% 1206
3330	4822 051 30332	3k3 5% 0.062W
3331	4822 051 30102	1k 5% 0.062W
3333	4822 051 30102	1k 5% 0.062W
3334	4822 051 30102	1k 5% 0.062W
3335	4822 117 12903	1k8 1% 0.063W
3336	4822 051 30102	1k 5% 0.062W
3337	4822 117 12903	1k8 1% 0.063W
3338	4822 051 30392	3k9 5% 0.063W
3340	4822 051 30101	100Ω 5% 0.062W
3341	4822 051 30101	100Ω 5% 0.062W
3342	4822 051 30101	100Ω 5% 0.062W
3343	4822 051 30683	68k 5% 0.062W
3344	4822 051 30222	2k2 5% 0.062W
3345	4822 051 30103	10k 5% 0.062W
3346	4822 051 30333	33k 5% 0.062W
3347	4822 051 30223	22k 5% 0.062W
3348	4822 051 30222	2k2 5% 0.062W
3361	4822 051 30151	150Ω 5% 0.062W
3362	4822 051 30103	10k 5% 0.062W
3363	4822 051 30102	1k 5% 0.062W
3364	4822 051 30683	68k 5% 0.062W
3365	4822 051 30472	4k7 5% 0.062W
3366	4822 051 30102	1k 5% 0.062W
3367	4822 051 30102	1k 5% 0.062W
3370	4822 051 30101	100Ω 5% 0.062W
3371	4822 051 30479	47Ω 5% 0.062W
3372	4822 051 30471	470Ω 5% 0.062W
3376	4822 051 30101	100Ω 5% 0.062W
3377	4822 051 30101	100Ω 5% 0.062W
3378	4822 051 30153	15k 5% 0.062W
3382	4822 051 30471	470Ω 5% 0.062W
3384	4822 051 30101	100Ω 5% 0.062W
3385	4822 051 30471	470Ω 5% 0.062W
3386	4822 051 30223	22k 5% 0.062W
3388	4822 051 30681	680Ω 5% 0.062W
3389	4822 117 12925	47k 1% 0.063W
3390	4822 051 30183	18k 5% 0.062W

3391	4822 051 30683	68k 5% 0.062W
3393	4822 117 13632	100k 1% 0.62W
3394	4822 051 30472	4k7 5% 0.062W
3400	4822 117 11152	4Ω7 5%
3406	4822 051 30479	47Ω 5% 0.062W
3411	4822 051 30472	4k7 5% 0.062W
3414	4822 051 30472	4k7 5% 0.062W
3415	4822 051 30222	2k2 5% 0.062W
3416	4822 117 13568	6Ω8 5% 1206
3418	4822 051 30391	390Ω 5% 0.062W
3419	4822 051 30759	75Ω 5% 0.062W
3435	4822 051 30472	4k7 5% 0.062W
3436	4822 051 30221	220Ω 5% 0.062W
3437	4822 051 30102	1k 5% 0.062W
3439	4822 051 30471	470Ω 5% 0.062W
3441	4822 051 30103	10k 5% 0.062W
3445	4822 051 30471	470Ω 5% 0.062W
3446	4822 051 30101	100Ω 5% 0.062W
3532	4822 051 30102	1k 5% 0.062W
3533	4822 051 30103	10k 5% 0.062W
3540	4822 051 30103	10k 5% 0.062W
3550	4822 051 30102	1k 5% 0.062W
3551	4822 051 30102	1k 5% 0.062W
3610	4822 117 12925	47k 1% 0.063W
3611	4822 117 12925	47k 1% 0.063W
3612	4822 117 12925	47k 1% 0.063W
3613	4822 117 12925	47k 1% 0.063W
3614	4822 117 12925	47k 1% 0.063W
3615	4822 117 12925	47k 1% 0.063W
3621	4822 051 30105	1M 5% 0.062W
3637	4822 051 30105	1M 5% 0.062W
3653	4822 051 30008	0Ω jumper
3654	4822 051 30008	0Ω jumper
3655	4822 051 30101	100Ω 5% 0.062W
3656	4822 051 30101	100Ω 5% 0.062W
3658	4822 051 30334	330k 5% 0.062W
3660	4822 051 30334	330k 5% 0.062W
3662	3198 017 31530	15nF 50V
3673	4822 051 30472	4k7 5% 0.062W
3680	3198 017 31530	15nF 50V
3683	4822 051 30272	2k7 5% 0.062W
3684	4822 051 30008	0Ω jumper
3685	4822 051 30008	0Ω jumper
3688	4822 051 30008	0Ω jumper
3689	4822 051 30008	0Ω jumper
3702	4822 117 12139	22Ω 5% 0.062W
3703	4822 051 30101	100Ω 5% 0.062W
3705	4822 051 30101	100Ω 5% 0.062W
3706	4822 051 30109	10Ω 5% 0.062W
3707	4822 051 30392	3k9 5% 0.063W
3708	4822 051 30272	2k7 5% 0.062W
3709	4822 051 30008	0Ω jumper
3710	4822 051 30391	390Ω 5% 0.062W
3711	4822 051 30102	1k 5% 0.062W
3712	4822 051 30391	390Ω 5% 0.062W
3713	4822 051 30391	390Ω 5% 0.062W
3714	4822 117 12139	22Ω 5% 0.062W
3716	4822 051 30472	4k7 5% 0.062W
3717	4822 051 30472	4k7 5% 0.062W
3718	4822 051 30221	220Ω 5% 0.062W
3719	4822 117 13574	1Ω5 5%
3720	4822 117 13574	1Ω5 5%
3721	4822 117 13572	22Ω 5%
3722	4822 117 13572	22Ω 5%
3725	4822 051 30105	1M 5% 0.062W
3728	4822 051 30101	100Ω 5% 0.062W
3731	4822 051 30101	100Ω 5% 0.062W
3732	4822 051 10102	1k 2% 0.25W
3733	4822 051 30101	100Ω 5% 0.062W
3739	4822 051 30101	100Ω 5% 0.062W
3740	4822 051 30008	0Ω jumper
3741	4822 051 30102	1k 5% 0.062W
3744	4822 051 30102	1k 5% 0.062W
3745	4822 051 30102	1k 5% 0.062W
3746	4822 051 30472	4k7 5% 0.062W
3747	4822 051 30689	68Ω 5% 0.063W
3748	4822 051 30689	68Ω 5% 0.063W
3749	4822 051 30689	68Ω 5% 0.063W
3754	4822 051 30109	10Ω 5% 0.062W
3755	4822 051 30008	0Ω jumper
3757	4822 051 30008	0Ω jumper
3759	4822 051 30008	0Ω jumper
3790	3198 031 11010	4 X 100Ω PM5
3791	3198 031 11010	4 X 100Ω PM5
3792	3198 031 11010	4 X 100Ω PM5
3793	3198 031 11010	4 X 100Ω PM5
3794	3198 031 11010	4 X 100Ω PM5
3795	3198 031 11010	4 X 100Ω PM5
3796	4822 051 30101	100Ω 5% 0.062W
3797	4822 051 30101	100Ω 5% 0.062W
3798	4822 117 13572	22Ω 5%

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5301	4822 157 11876	6.8µH 10%
5302	4822 157 11876	6.8µH 10%
5403	2422 549 44461	COI VAR
5404	2422 535 95427	Bead 120R at 100MHz
5405	2422 535 95427	Bead 120R at 100MHz
5406	3198 018 33980	3.9uH PM10
5407	3198 018 56880	6.8uH PM10
5408	2422 549 44983	COI VAR
5409	3198 018 51080	1uH PM10
5410	3198 018 33370	0.33uH PM10
5651	2422 549 43769	Bead 30R at 100MHz
5652	2422 549 43769	Bead 30R at 100MHz
5653	2422 549 43769	Bead 30R at 100MHz
5654	4822 157 11716	Bead BLM21P300SPT
5701	4822 157 71206	Bead BLM21A601SPT
5702	2422 535 95427	Bead 120R at 100MHz
5703	4822 157 11716	Bead BLM21P300SPT
5704	4822 157 11716	Bead BLM21P300SPT
5705	2422 535 95427	Bead 120R at 100MHz
5706	4822 157 11778	5.6uH 10%
5707	4822 157 11074	100µH
5708	4822 157 11778	5.6uH 10%
5709	4822 157 11778	5.6uH 10%
5710	4822 157 11778	5.6uH 10%
5711	4822 157 11074	100µH
5713	4822 157 11074	100µH
5718	3198 018 33370	0.33uH PM10
5720	4822 157 11074	100µH
5911	4822 157 11074	100µH
5912	4822 157 11074	100µH
5913	4822 157 11074	100µH
5914	4822 157 11074	100µH
5915	4822 157 11074	100µH
5916	4822 157 11074	100µH
5917	4822 157 11074	100µH
5918	4822 157 11074	100µH
5919	4822 157 11074	100µH
5920	4822 157 11074	100µH
5921	4822 157 11074	100µH
5922	4822 157 11074	100µH
5923	4822 157 11074	100µH
5924	4822 157 11074	100µH
5925	4822 157 11074	100µH
5926	4822 157 11074	100µH
5927	4822 157 11074	100µH
5928	4822 157 11074	100µH
5929	4822 157 11074	100µH
5930	4822 157 11074	100µH
5931	4822 157 11074	100µH
5932	4822 157 11074	100µH
5933	4822 157 11074	100µH
5934	4822 157 11074	100µH
5935	4822 157 11074	100µH
5940	4822 157 11074	100µH
5941	4822 157 11074	100µH
5942	4822 157 11074	100µH
5943	4822 157 11074	100µH
5944	4822 157 11074	100µH
5947	4822 157 11074	100µH
5948	4822 157 11074	100µH
5949	4822 157 11074	100µH
5950	4822 157 11074	100µH
5951	4822 157 11074	100µH

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6001	4822 130 11528	1PS76SB10
6002	4822 130 83757	MCL4148
6003	4822 130 11528	1PS76SB10
6303	4822 130 11594	BZX284-C47
6304	4822 130 83757	MCL4148
6306	9322 129 37685	DIO REG SM BZM55-C5V6 (TEG0)
6307	4822 130 11528	1PS76SB10
6309	4822 130 83757	MCL4148
6310	9322 129 38685	DIO REG SM BZM55-C6V8 (TEG0)
6311	9322 149 08685	DIO REG SM BZM55-C22 (VISH) R
6312	4822 130 83757	MCL4148
6313	9322 149 08685	DIO REG SM BZM55-C22 (VISH) R
6314	4822 130 83757	MCL4148
6319	4822 130 83757	MCL4148
6334	4822 130 83757	MCL4148
6403	4822 130 11525	1SS356
6652	9322 129 40685	BZM55-C10
6653	4822 130 83757	MCL4148

7001	9352 629 88557	SAA5801H/011
7002	9340 218 50115	BC857BW
7003	3198 010 42310	BC847BW
7004	3198 010 42310	BC847BW
7005	9322 116 74668	LD1117D33
7006	9965 000 07280	Software, see Prod.Surv.
7007	9322 157 20668	MSM51V18165F-60J
7008	3198 010 42310	BC847BW
7009	3198 010 42310	BC847BW
7010	9340 218 50115	BC857BW
7011	9322 156 81668	M24C32-WMN6TNKSA
7014	3198 010 42310	BC847BW
7015	9340 218 50115	BC857BW (PHSE)
7301	9352 685 88518	TDA9330H/N2/S2
7303	9340 218 50115	BC857BW (PHSE)
7308	9340 310 30215	PDTC144ET
7309	9340 310 30215	PDTC144ET
7310	9340 310 30215	PDTC144ET
7311	3198 010 42310	BC847BW
7312	3198 010 42310	BC847BW
7320	3198 010 42310	BC847BW
7322	3198 010 42310	BC847BW
7323	9352 625 24518	TDA9321H/N2
7324	9340 217 80115	BC847CW
7340	3198 010 42310	BC847BW
7403	4822 130 60511	BC847B
7407	4822 130 60373	BC856B
7411	4822 130 60511	BC847B
7651	9322 169 38702	MSP3411G-FH-B8
7652	9351 874 90118	74HC4052PW
7656	9340 425 20115	BC847BS
7674	3198 010 42310	BC847BW
7680	3198 010 42310	BC847BW
7701	9340 218 50115	BC857BW
7702	3198 010 42310	BC847BW
7704	4822 209 73852	PMBT2369
7708	4822 209 90034	SAA4990H/V0
7709	9352 640 20557	SAA4978H/V203
7713	9322 116 74668	LD1117D33
7714	4822 209 17307	MSM54V12222A-30JS
7715	4822 209 17307	MSM54V12222A-30JS
7716	3104 317 42341	FBX Software R_EP_2

DC-shift + Anti-Moiré [G]

Various

0317	4822 265 20723	CON 2P Male
0318	4822 265 20723	CON 2P Male
0325	2422 025 16382	CON 3P Male
0329	2422 025 16382	CON 3P Male
0395	2422 025 16407	CON 3P Male
1430	2422 086 10581	Fuse 400mA

2430	4822 122 31177	470pF 10% 500V
2431	4822 122 31177	470pF 10% 500V
2640	4822 124 11767	470µF 20% 25V
2641	4822 126 14305	100nF 10% 16V

3640	4822 051 30103	10k 5% 0.062W
3641	4822 051 30223	22k 5% 0.062W
3642	4822 052 10229	22Ω 5% 0.33W
3648	5322 117 13029	47k 1% 0.063W
3649	2322 704 65603	56k 1% 0.063W
3650	5322 117 13037	2k2 1% 0.063W
3651	4822 051 30221	220Ω 5% 0.062W
3652	4822 051 30152	1k5 5% 0.062W
3999	4822 051 30102	1k 5% 0.062W

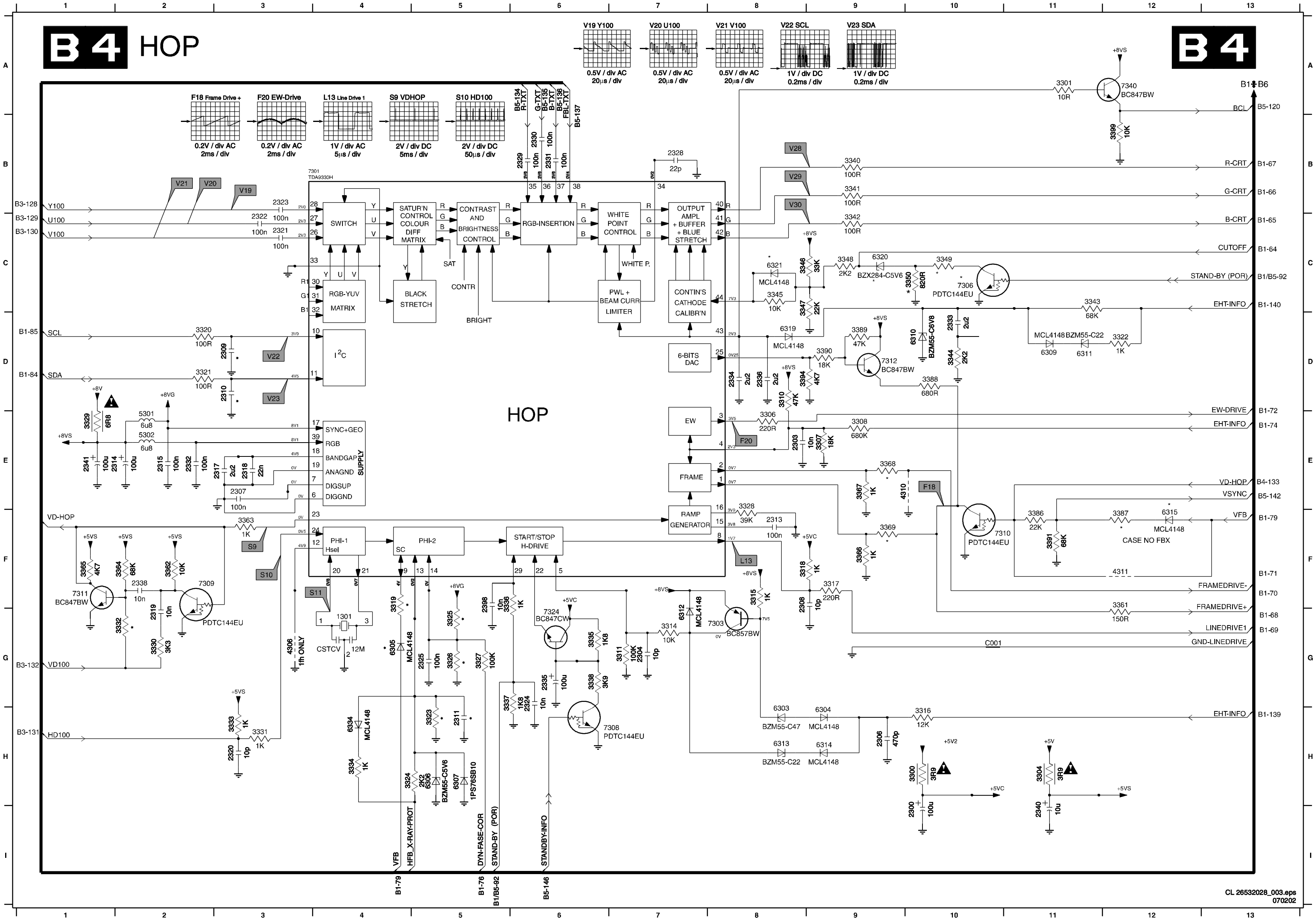
5430	3128 138 38911	DC SHIFT COIL

6432	9340 317 00133	BYD33V
6433	9340 317 00133	BYD33V
6640	4822 130 83757	MCL4148
6641	9340 548 67115	PDZ22B
6642	4822 130 11148	UDZ4.7B
6643	9340 548 52115	PDZ5.1B
6646	4822 130 83757	MCL4148

7640	9337 133 90653	74HCT74D
7642	4822 130 60373	BC856B

Electrical Diagrams and Print-Layouts

SSB: HOP


B4
HOP
V19 Y100
0.5V / div AC
20µs / div
V20 U100
0.5V / div AC
20µs / div
V21 V100
0.5V / div AC
20µs / div
V22 SCL
1V / div DC
0.2ms / div
V23 SDA
1V / div DC
0.2ms / div
F18 Frame Drive +
0.2V / div AC
2ms / div
F20 EW-Drive
0.2V / div AC
2ms / div
L13 Line Drive 1
1V / div AC
5µs / div
S9 VDHOP
2V / div DC
5ms / div
S10 HD100
2V / div DC
50µs / div
7301
TDA9330H
SWITCH
SATUR'N CONTROL COLOUR DIFF MATRIX
CONTRAST AND BRIGHTNESS CONTROL
RGB-INSERTION
WHITE POINT CONTROL
OUTPUT AMPL + BUFFER + BLUE STRETCH
RGB-YUV MATRIX
BLACK STRETCH
PWL + BEAM CURR LIMITER
CONTIN'S CATHODE CALIBR'N
I²C
6-BITS DAC
EW
FRAME
RAMP GENERATOR
SYNC+GEO
RGB
BANDGAP
ANAGND
DIGSUP
DIGGND
SUPPLY
PHI-1 Hsel
PHI-2
START/STOP H-DRIVE
SAT
CONTR
BRIGHT
WHITE P.
B3-128 Y100
B3-129 U100
B3-130 V100
B1-85 SCL
B1-84 SDA
VD-HOP
B3-132 VD100
B3-131 HD100
B5-134 R-TXT
G-TXT
B5-135
B-TXT
B5-136
FBL-TXT
B5-137
B1 B6
BCL B5-120
R-CRT B1-67
G-CRT B1-66
B-CRT B1-65
CUTOFF B1-64
STAND-BY (POR) B1/B5-92
EHT-INFO B1-140
EW-DRIVE B1-72
EHT-INFO B1-74
VD-HOP B4-133
VSYNC B5-142
VFB B1-79
B1-71
FRAMEDRIVE- B1-70
FRAMEDRIVE+ B1-68
LINEDRIVE1 B1-69
GND-LINEDRIVE
C001
EHT-INFO B1-139
CASE NO FBX
VFB B1-79
HFB_X-RAY-PROT
DYN-FASE-COR B1-76
STAND-BY (POR) B1/B5-92
STANDBY-INFO B5-146
1301 CSTCV 12M
4306 1fh ONLY
7340 BC847BW
7306 PDTC144EU
7312 BC847BW
7310 PDTC144EU
7311 BC847BW
7309 PDTC144EU
7324 BC847CW
7308 PDTC144EU
7303 BC857BW
+8VS
+8VG
+8V
+5VS
+5VC
+5VG
+5V2
+5V
CL 26532028_003.eps
070202

1301	G4
2300	I10
2303	E8
2304	G7
2306	H9
2307	E3
2308	F8
2309	D3
2310	D3
2311	H5
2313	F8
2314	E2
2315	E2
2317	E3
2318	E3
2319	G2
2320	H3
2321	C3
2322	C3
2323	B3
2324	G6
2325	G5
2328	B7
2329	B6
2330	B6
2331	B6
2332	E2
2333	D10
2334	D8
2335	G6
2336	D8
2338	F2
2340	I11
2341	E1
2398	F5
3300	H10
3301	A11
3304	H11
3306	E8
3307	E9
3308	E9
3310	D8
3311	G7
3314	G7
3315	F8
3316	H10
3317	F9
3318	F8
3319	F4
3320	D2
3321	D2
3322	D12
3323	H5
3324	H4
3325	G5
3326	G5
3327	G5
3328	E8
3329	E1
3330	G2
3331	H3
3332	G2
3333	H3
3334	H4
3335	G6
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3338	G6
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3341	B9
3342	C9
3343	C11
3344	D10
3345	C8
3346	C8
3347	C8
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3350	C10
3361	F12
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3390	D9
3391	F11
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4310	E10
4311	F12
5301	E2
5302	E2
6303	H8
6304	H9
6305	G4
6306	H5
6307	H5
6309	D11
6310	D10
6311	D11
6312	G7
6313	H8
6314	H9
6315	F12
6319	D8
6320	C9
6321	C8
6334	H4
7301	B3
7303	G8
7306	C10
7308	H6
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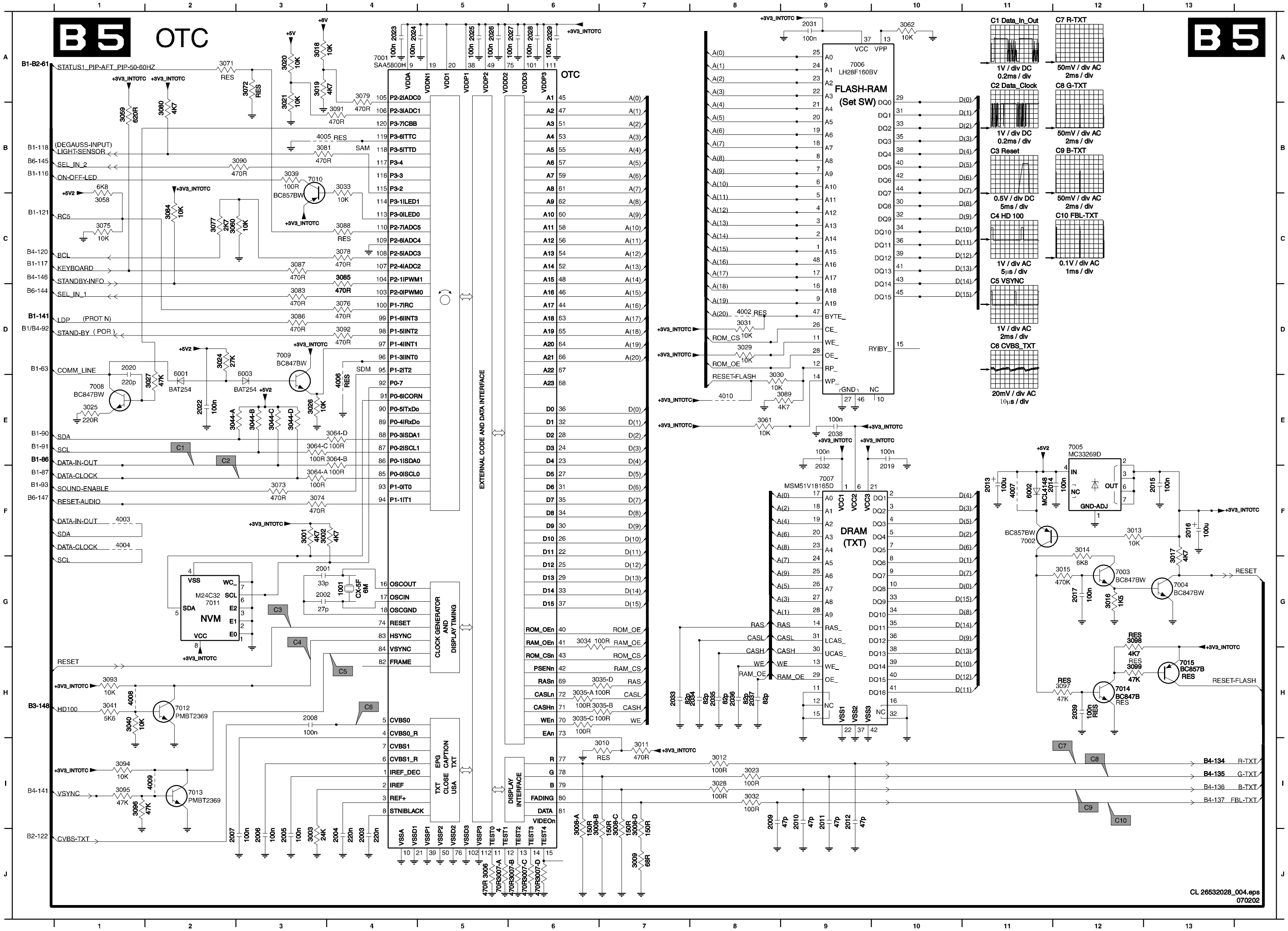
7310	F11
7311	F1
7312	D9
7324	G6
7340	A12
C001	G10

SSB: OTC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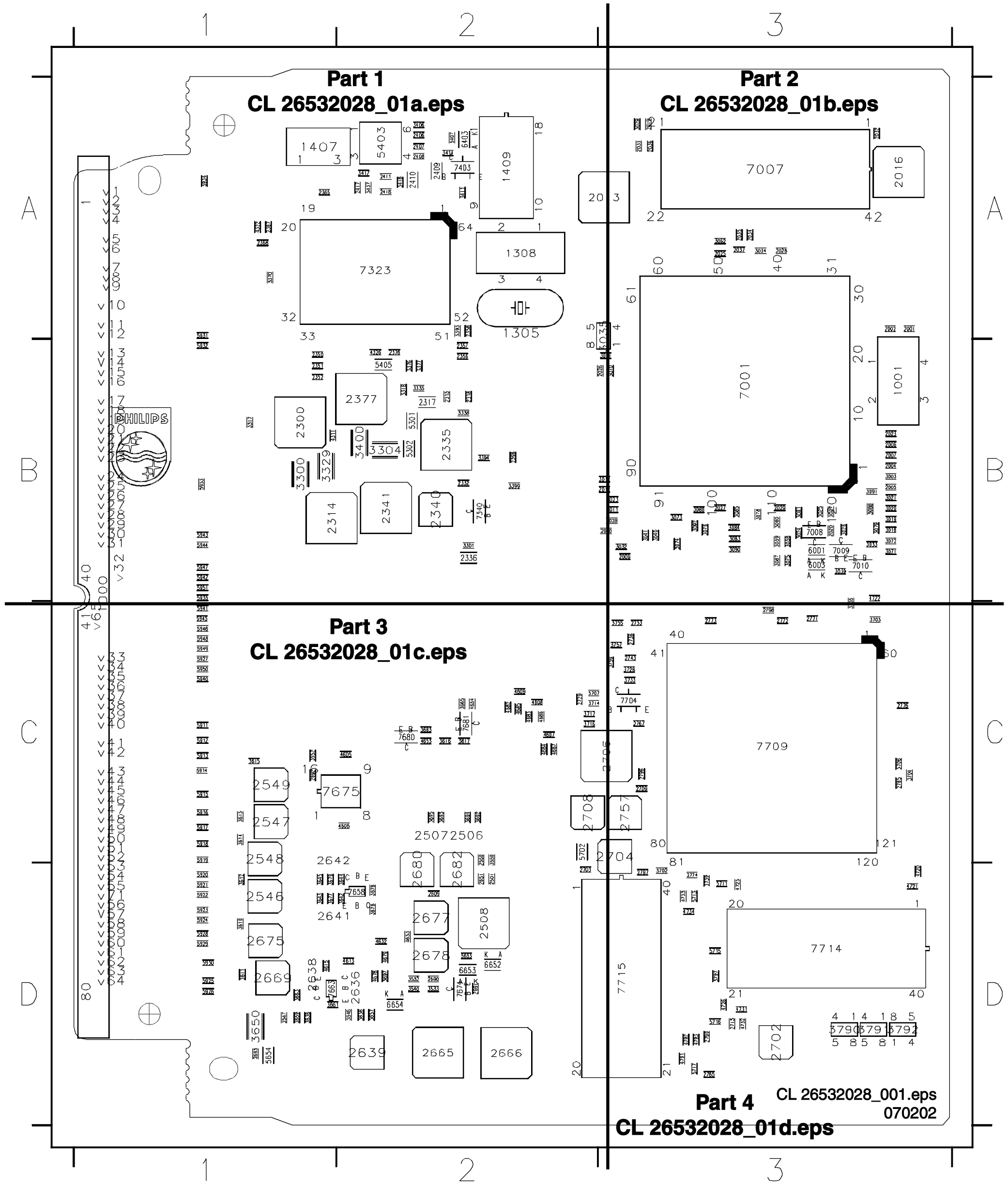
OTC
SAA5800H
7001
FLASH-RAM (Set SW)
7006 LH28F160BV
DRAM (TXT)
7007 MSM51V18165D
NVM
M24C32 7011
EXTERNAL CODE AND DATA INTERFACE
CLOCK GENERATOR AND DISPLAY TIMING
EPG CLOSE CAPTION TXT USA
DISPLAY INTERFACE
C1 Data_In_Out
C2 Data_Clock
C3 Reset
C4 HD 100
C5 VSYNC
C6 CVBS_TXT
C7 R-TXT
C8 G-TXT
C9 B-TXT
C10 FBL-TXT
1V / div DC 0.2ms / div
0.5V / div DC 5ms / div
1V / div AC 5μs / div
1V / div AC 2ms / div
20mV / div AC 10μs / div
50mV / div AC 2ms / div
0.1V / div AC 1ms / div
7005 MC33269D
B1-B2-61 STATUS1_PIP-AFT_PIP-50-60HZ
B1-118 (DEGAUSS-INPUT) LIGHT-SENSOR
B6-145 SEL_IN_2
B1-116 ON-OFF-LED
B1-121 RC5
B4-120 BCL
B1-117 KEYBOARD
B4-146 STANDBY-INFO
B6-144 SEL_IN_1
B1-141 LDP (PROT N)
B1/B4-92 STAND-BY (POR)
B1-63 COMM_LINE
B1-90 SDA
B1-91 SCL
B1-86 DATA-IN-OUT
B1-87 DATA-CLOCK
B1-93 SOUND-ENABLE
B6-147 RESET-AUDIO
RESET
B3-148 HD100
B4-141 VSYNC
B2-122 CVBS-TXT
B4-134 R-TXT
B4-135 G-TXT
B4-136 B-TXT
B4-137 FBL-TXT
RESET-FLASH
CL 26532028_004.eps 070202

1001	G4
2001	G3
2002	G3
2003	J4
2004	J4
2005	J3
2006	J3
2007	J2
2008	H3
2009	I8
2010	I9
2011	I9
2012	I9
2013	F11
2014	F11
2015	F13
2016	F13
2017	G12
2019	E10
2020	D1
2022	E2
2023	A4
2024	A4
2025	A5
2026	A5
2027	A6
2028	A6
2029	A6
2031	A9
2032	E9
2033	H7
2034	H8
2035	H8
2036	H8
2037	H8
2038	E9
2039	H12
3001	F3
3002	F3
3003	J3
3006	J5
3007-A	J5
3007-B	J6
3007-C	J6
3007-D	J6
3008-A	I6
3008-B	I6
3008-C	I7
3008-D	I7
3009	J7
3010	I7
3011	I7
3012	I8
3013	F12
3014	F12
3015	G12
3016	G12
3017	F13
3018	A3
3019	A3
3020	A3
3021	A3
3023	I8
3024	D2
3025	E1
3026	E3
3027	E2
3028	I8
3029	D8
3030	E8
3031	D8
3032	I8
3033	B4
3034	G6
3035-A	H6
3035-B	H7
3035-C	H6
3035-D	H7
3039	B3
3040	H1
3041	H1
3044-A	**E2**
3044-B	**E3**
3044-C	**E3**
3044-D	**E3**
3058	**C1**
3059	**B1**
3060	**C2**
3061	**E8**
3062	**A10**
3064-A	**F3**
3064-B	**E4**
3064-C	**E3**
3064-D	**E4**
3071	A2
3072	A3
3073	F3
3074	F3
3075	C1
3076	D4
3077	C2
3078	C4
3079	A4
3080	B2
3081	B3
3083	D3
3084	C2
3085	C4
3086	D3
3087	C3
3088	C4
3089	E9
3090	B3
3091	B4
3092	D4
3093	H1
3094	I1
3095	I1
3096	I1
3097	H12
3098	G12
3099	H12
4002	D8
4003	F1
4004	F1
4005	B3
4006	E4
4007	F11
4008	H1
4009	I2
4010	E8
6001	E2
6002	F11
6003	E3
7001	A4
7002	F11
7003	G12
7004	G13
7005	E12
7006	A9
7007	**F9**
7008	**E1**
7009	**D3**
7010	**B3**
7011	**G2**
7012	**H2**
7013	I2
7014	H12
7015	H13

Layout SSB (Overview LOT Side)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2
3
A
B
C
D
Part 1
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Part 2
CL 26532028_01b.eps
Part 3
CL 26532028_01c.eps
Part 4
CL 26532028_01d.eps
PHILIPS
1407
5403
1409
2013
7007
2016
7323
1308
1305
7001
1001
2377
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2340
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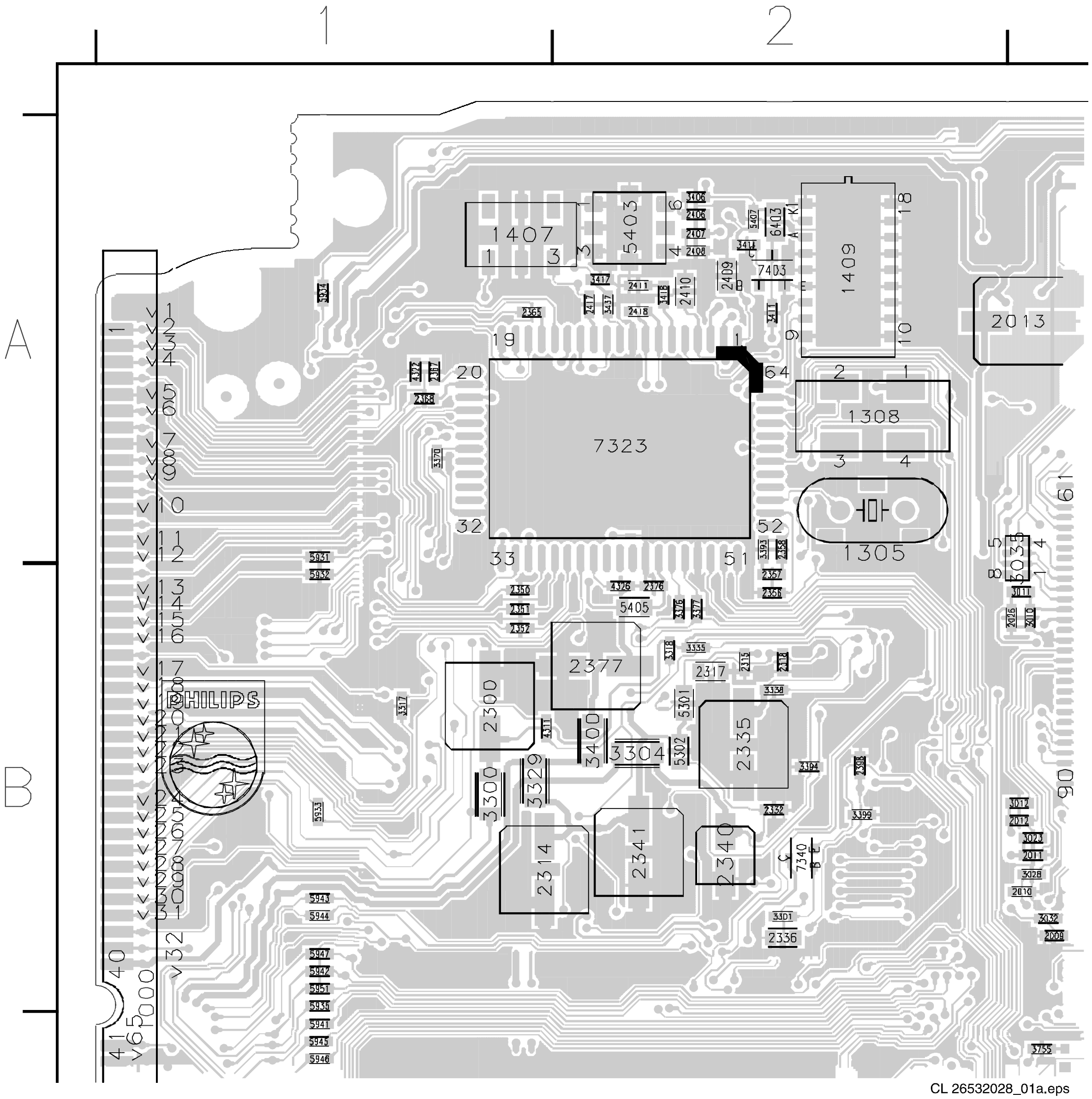
7714
2702
2639
2665
2666
3650
CL 26532028_001.eps
070202

1000	B1	2550	C2	3072	B3	3683	C2	5716	D3
1001	B3	2609	D2	3073	B3	3692	C2	5717	D3
1305	A2	2636	D2	3074	B3	3693	C2	5911	C1
1308	A2	2638	D1	3075	B3	3694	C2	5912	C1
1407	A1	2639	D1	3076	B3	3695	C2	5913	C1
1409	A2	2641	D1	3078	B3	3697	D2	5914	C1
2001	A3	2642	C2	3079	B3	3702	D3	5915	C1
2002	A3	2651	D2	3080	B3	3703	C3	5916	C1
2004	B3	2665	D2	3081	B3	3704	C3	5917	C1
2005	B3	2666	D2	3083	B3	3705	C3	5918	C1
2006	B3	2669	D1	3084	B3	3706	C3	5919	C1
2007	B3	2675	D1	3085	B3	3714	C2	5920	D1
2009	B3	2677	D2	3086	B3	3716	C2	5921	D1
2010	B3	2678	D2	3087	B3	3717	C2	5922	D1
2011	B3	2680	D2	3088	B3	3728	C3	5923	D1
2012	B3	2682	C2	3090	B3	3733	C3	5924	D1
2013	A3	2690	D2	3091	B3	3739	D3	5925	D1
2016	A3	2691	D2	3092	B3	3755	C3	5926	D1
2019	A3	2692	C1	3300	B1	3757	C3	5927	C1
2020	B3	2693	D1	3301	B2	3759	C3	5928	D1
2023	B3	2702	D3	3304	B2	3790	D3	5929	D1
2025	A3	2703	D2	3317	B1	3791	D3	5930	D1
2026	B3	2704	C3	3318	B2	3792	D3	5931	A1
2027	B3	2706	C2	3329	B2	3797	D3	5932	B1
2028	A3	2708	C2	3335	B2	4311	B1	5933	B1
2029	B3	2709	C3	3338	B2	4322	A1	5934	A1
2032	A3	2713	D3	3370	A1	4326	B2	5935	B1
2033	A3	2729	C2	3376	B2	4605	C2	5940	C1
2034	A3	2733	C3	3377	B2	4606	C2	5941	C1
2035	A3	2738	C3	3393	A2	4607	C2	5942	B1
2036	A3	2743	C3	3394	B2	4608	C2	5943	B1
2037	A3	2757	C3	3399	B2	4609	C2	5944	B1
2300	B1	2765	D3	3400	B2	4613	D2	5945	C1
2314	B1	2767	C3	3406	A2	4615	D1	5946	C1
2315	B2	2771	C3	3411	A2	4632	D2	5947	B1
2317	B2	2772	C3	3414	A2	4633	D2	5948	C1
2318	B2	2773	C3	3417	A2	4653	C2	5949	C1
2332	B2	2774	D3	3418	A2	4654	C2	5950	C1
2335	B2	2776	C3	3437	A2	4678	D2	5951	B1
2336	B2	2785	C3	3532	D2	4679	D2	6001	B3
2340	B2	2790	D3	3533	D2	4682	C2	6003	B3
2341	B2	2796	C3	3540	D2	4683	C2	6403	A2
2350	B1	2797	D3	3546	D2	4684	C2	6652	D2
2351	B1	2798	C3	3547	D1	4685	C2	6653	D2
2352	B1	3003	B3	3550	C2	4686	C2	6654	D2
2356	B2	3010	B3	3552	C1	4687	C2	7001	B3
2357	B2	3011	B3	3610	D1	4720	D3	7007	A3
2358	A2	3012	B3	3611	D1	4721	D3	7008	B3
2365	A1	3018	B3	3612	D1	4722	B3	7009	B3
2367	A1	3019	B3	3613	C1	4723	D3	7010	B3
2368	A1	3020	B3	3614	C1	4726	D3	7323	A1
2376	B2	3021	B3	3615	C1	4731	D3	7340	B2
2377	B2	3023	B3	3616	C2	4732	D3	7403	A2
2398	B2	3024	B3	3617	C2	4733	D3	7658	D2
2406	A2	3025	B3	3636	D2	4734	D3	7663	D1
2407	A2	3026	B3	3638	D1	4791	D3	7674	D2
2408	A2	3027	B3	3642	D2	4792	D3	7675	C2
2409	A2	3028	B3	3643	D1	4793	D3	7680	C2
2410	A2	3029	A3	3644	D2	5301	B2	7681	C2
2411	A2	3032	B3	3645	D1	5302	B2	7704	C3
2417	A2	3033	B3	3650	D1	5403	A2	7709	D3
2418	A2	3034	A3	3657	D2	5405	B2	7714	D3
2501	D2	3035	A3	3659	D1	5407	A2	7715	D3
2506	C2	3039	B3	3661	D1	5653	D2		
2507	C2	3040	B3	3663	D1	5654	D1		
2508	D2	3041	B3	3665	C2	5702	C2		
2546	D1	3058	B3	3676	D2	5707	C2		
2547	C1	3059	B3	3677	D1	5711	D3		
2548	C1	3062	A3	3678	D2	5713	D3		
2549	C1	3071	B3	3679	D1	5715	D3		

Layout SSB (Part 1 LOT Side)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A
B
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2013
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2300
2335
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3300
3329
2314
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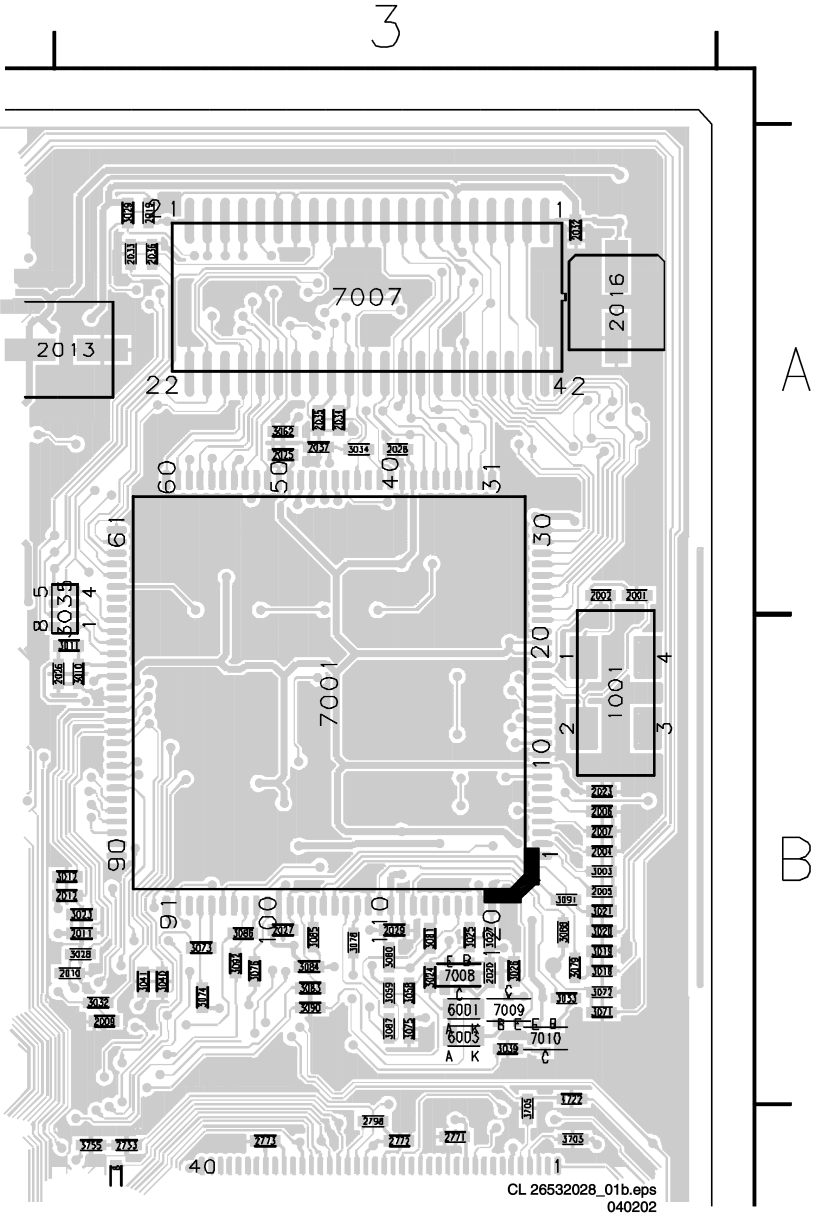
2317
5405
7403
6403
PHILIPS
1000

CL 26532028_01a.eps
070202

Layout SSB (Part 2 LOT Side)


3
A
B
7007
2016
2013
7001
1001
6003
7008
6001
7009
7010
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120
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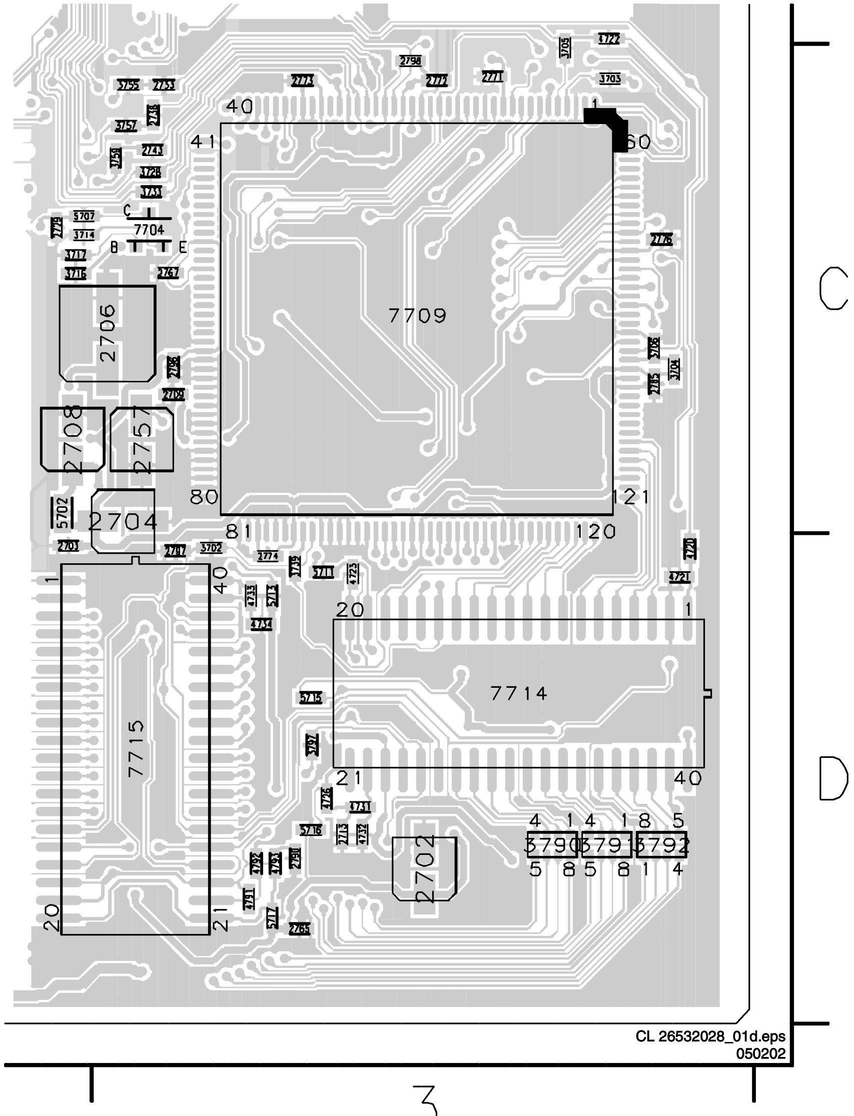
42

CL 26532028_01b.eps
040202

Layout SSB (Part 4 LOT Side)


C
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121
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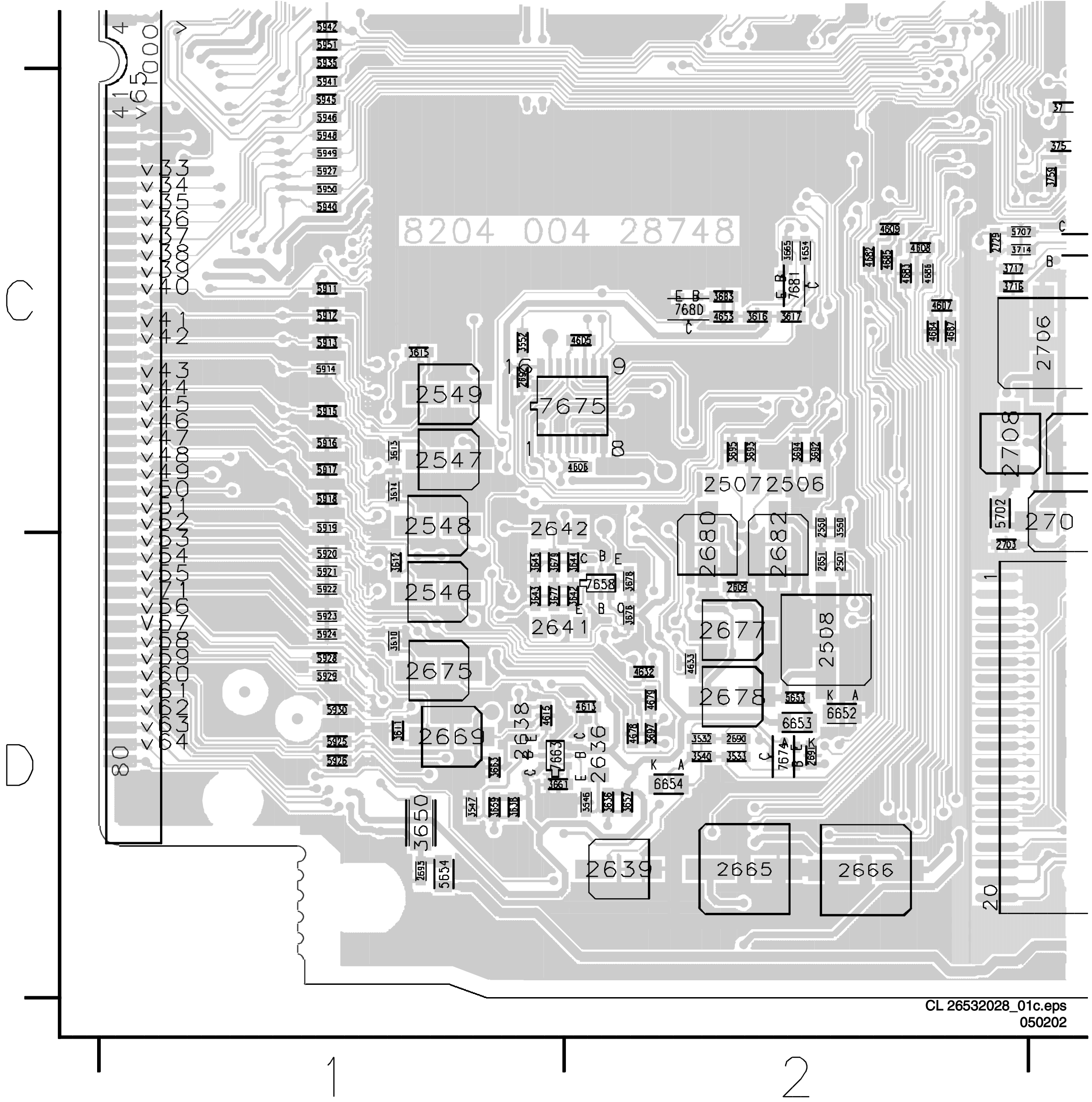
CL 26532028_01d.eps
050202

Layout SSB (Part 3 LOT Side)


C
D
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2
8204 004 28748
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5702
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71
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64
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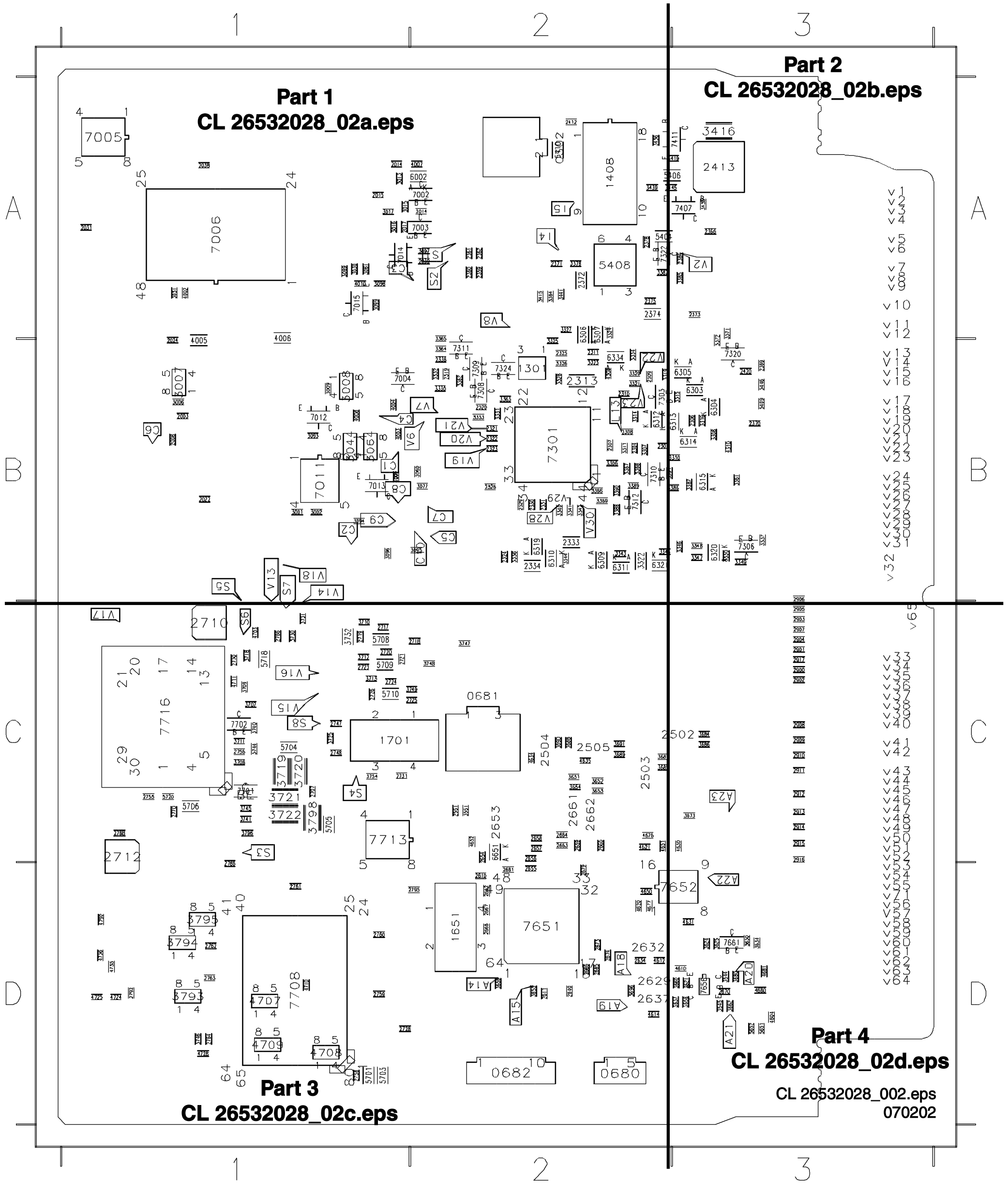
20

CL 26532028_01c.eps
050202

Layout SSB (Overview Tuner Side)



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0681	C2
0682	D2
1000	B3
1301	B2
1305	A2
1408	A2
1651	D2
1701	C1
2003	B1
2008	B1
2014	A1
2015	A1
2017	A1
2022	B1
2024	B1
2031	A1
2038	A1
2039	A2
2303	B2
2304	B2
2306	B3
2307	B2
2308	B2
2309	B2
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2311	B2
2313	B2
2319	B2
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2916	C3
2917	C3
3001	B1
3002	B1
3006	B1
3007	B1
3008	B1
3009	B1
3013	A1
3014	A2
3015	A1
3016	A1
3017	A1
3030	A1
3031	A1
3044	B1
3060	B2
3061	A1
3064	B1
3077	B2
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3098	A1
3099	A1
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3307	B2
3308	B3
3310	B3
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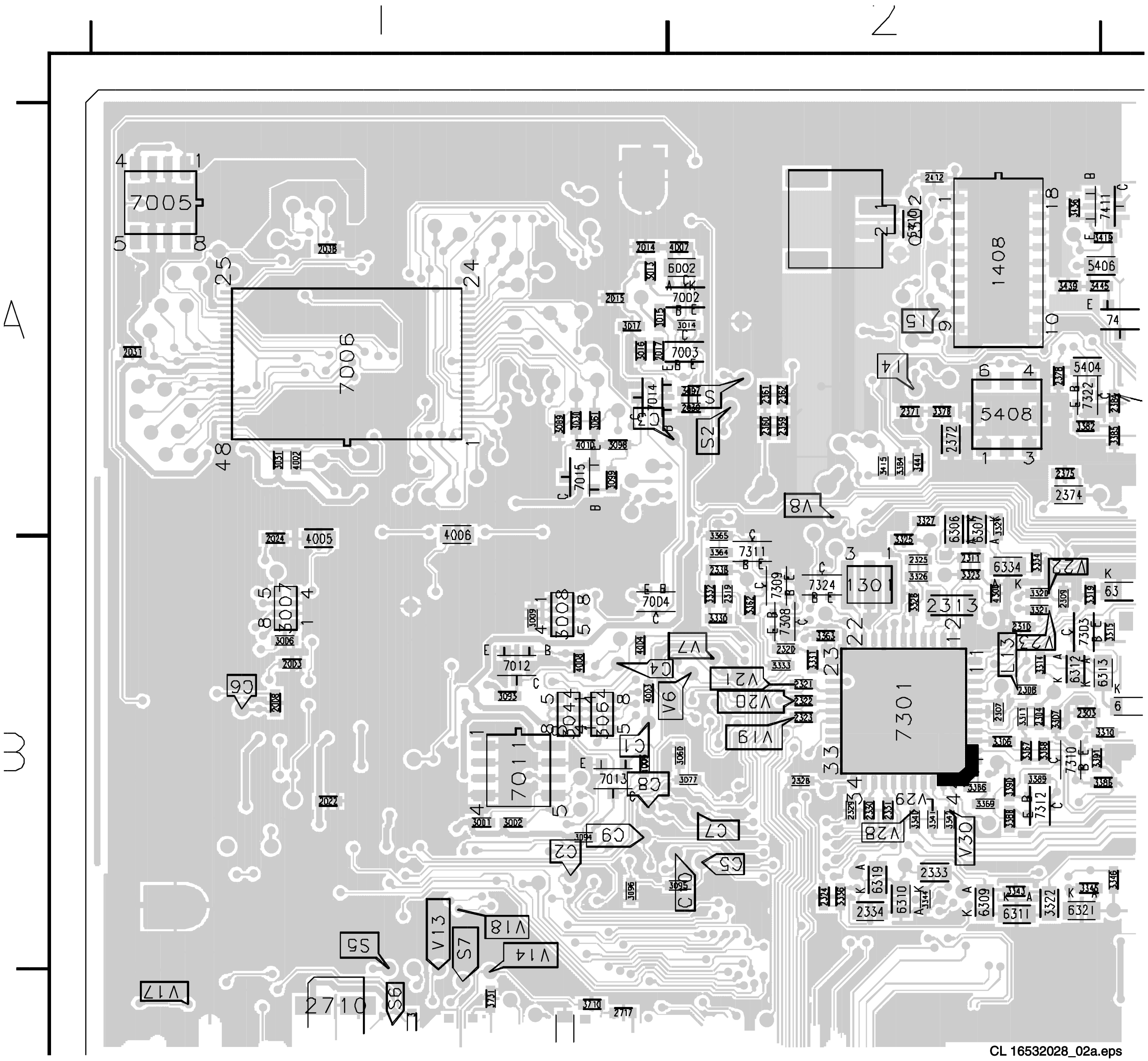
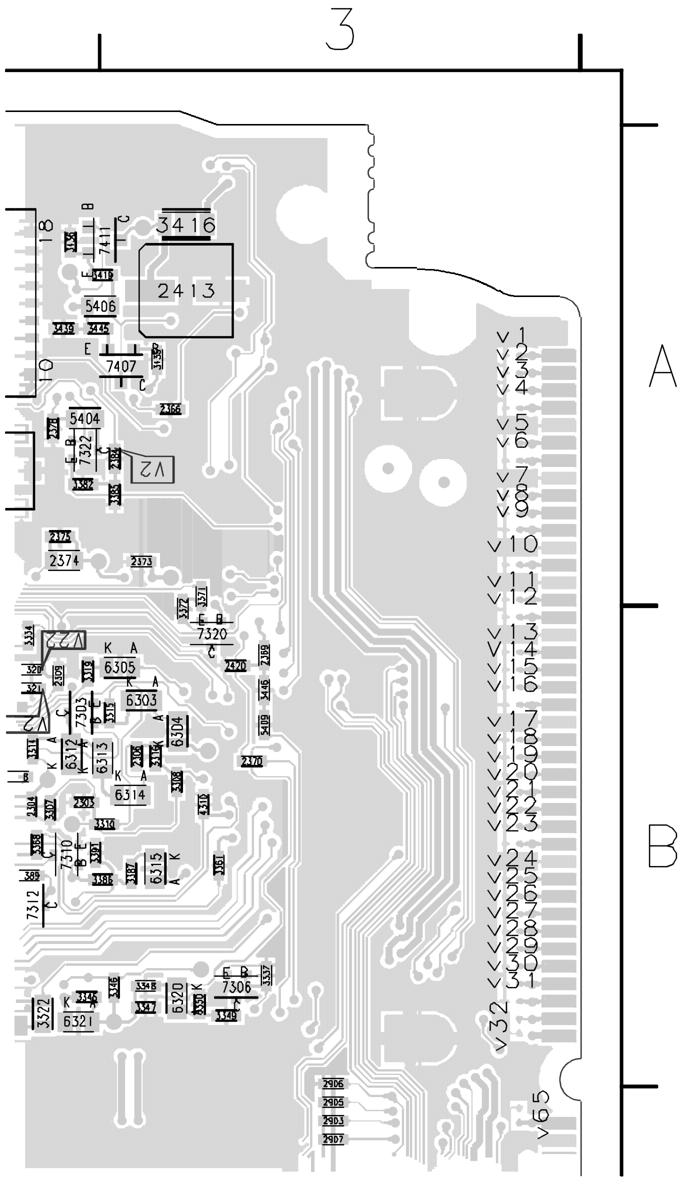
3389	B2
3390	B2
3391	B2
3415	A2
3416	A3
3419	A3
3435	A3
3436	A2
3439	A2
3441	A2
3445	A2
3446	B3
3544	D3
3545	D3
3551	C2
3621	D3
3624	D3
3625	D3
3630	D3
3634	D3
3637	D3
3651	C2
3652	C2
3653	C2
3654	C2
3655	D2
3656	D2
3658	D3
3660	D3
3662	D3
3673	C3
3680	D3
3684	C3
3685	C2
3686	C3
3687	C2
3688	C2
3689	C2
3690	C2
3691	C2
3696	D2
3707	C1
3708	C1
3709	C1
3710	C1
3711	C1
3712	C1
3713	C1
3718	C1
3719	C1
3720	C1
3721	C1
3722	C1
3725	C1
3730	C1
3731	C1
3732	C1
3740	C1
3741	C1
3744	C1
3745	C1
3746	D1
3747	C2
3748	C2
3749	C2
3754	C1
3793	D1
3794	D1
3795	D1
3796	C1
3798	C1
4002	A1
4003	B1
4004	B1
4005	B1
4006	A1
4007	A2
4008	B1
4009	B1
4010	A1
4306	B2
4310	B3
4604	D3
4610	D3
4612	D2
4614	D2
4620	D2
4621	C2
4630	C3
4631	D3
4634	C2
4635	C2
4650	D2
4651	C2
4652	C2
4676	C2
4677	D2
4680	D3
4681	D3
4703	C1
4707	D1
4708	D1
4709	D1
4710	D1
4711	C1
4724	D1
4725	D1
4728	D1
4735	D1
4736	D1
4790	D1
5404	A2
5406	A3
5408	A2
5409	B3
5410	A2
5651	D3
5652	D3
5701	D1
5703	D1
5704	C1
5705	C1
5706	C1
5708	C1
5709	C1
5710	C1
5718	C1
5720	C1
6002	A2
6303	B3
6304	B3
6305	B3
6306	A2
6307	A2
6309	B2
6310	B2
6311	B2
6312	B2
6313	B3
6314	B3
6315	B3
6319	B2
6320	B3
6321	B2
6334	A2
6651	C2
7002	A2
7003	A2
7004	B1
7005	A1
7006	A1
7011	B1
7012	B1
7013	B1
7014	A2
7015	A1
7301	B2
7303	B2
7306	B3
7308	B2
7309	B2
7310	B2
7311	A2
7312	B2
7320	B3
7322	A2
7324	B2
7407	A2
7411	A3
7651	D2
7652	C3
7656	D3
7661	D3
7701	C1
7702	C1
7708	D1
7713	D1
7716	C1

Layout SSB (Part 1 Tuner Side)


1
2
A
B
7005
7006
7002
7003
7004
7007
7008
7011
7012
7013
7014
7015
6002
4005
4006
1408
5406
5404
5408
7411
7322
1301
7301
7311
7324
7309
7308
7303
7310
7312
2313
2374
6334
6306
6307
6312
6313
6319
6310
6309
6311
6321
2333
2334
2372
2710
2717
3041
3064
V6
V7
V8
V13
V14
V17
V18
V19
V20
V21
V22
V23
V28
V29
V30
S
S2
S5
S6
S7
C1
C2
C3
C4
C5
C6
C7
C8
C9
C10
I4
I5
L13

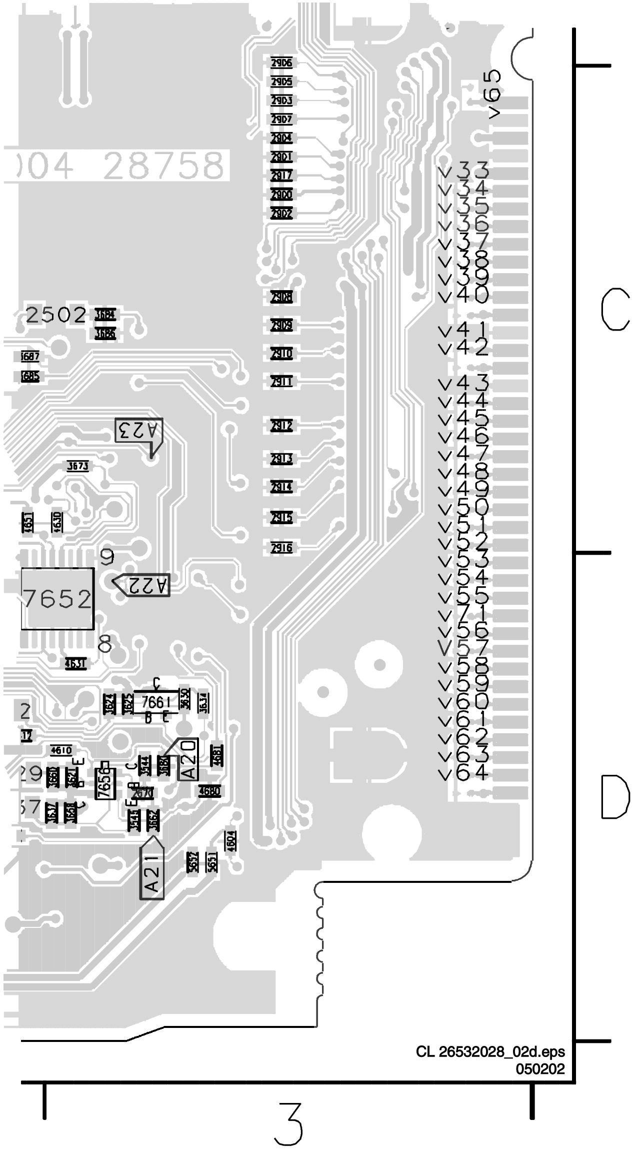
CL 16532028_02a.eps
050202

Layout SSB (Part 2 Tuner Side)


3
A
B
3416
2413
7411
5406
7407
5404
7322
V2
2375
2374
2373
7320
6305
6303
7303
6304
6312
6313
6314
7310
6315
7312
7306
6320
6321
3322
2906
2905
2903
2907
v1
v2
v3
v4
v5
v6
v7
v8
v9
v10
v11
v12
v13
v14
v15
v16
v17
v18
v19
v20
v21
v22
v23
v24
v25
v26
v27
v28
v29
v30
v31
v32
v65
18
10

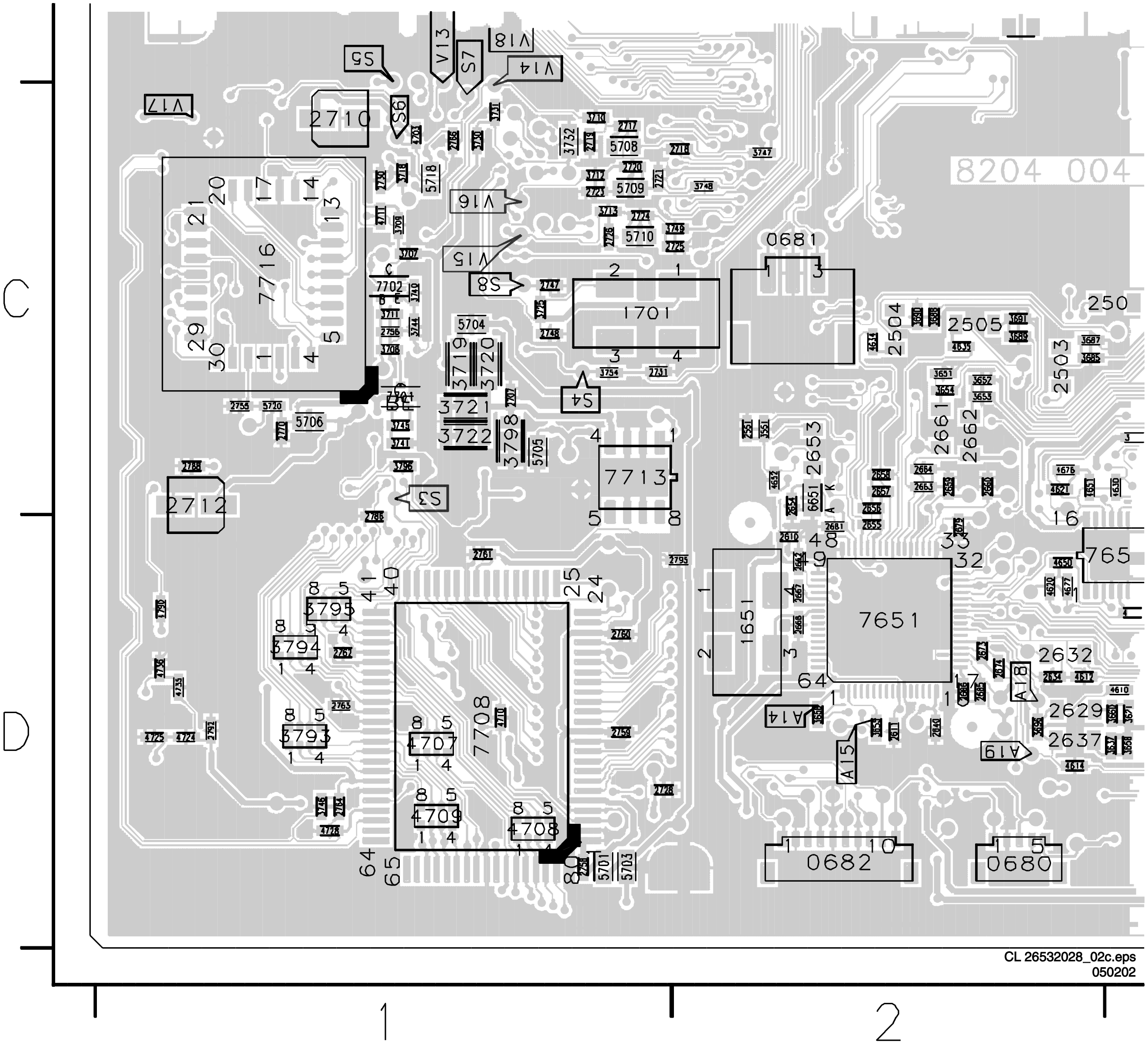
CL 26532028_02b.eps
050202

Layout SSB (Part 4 Tuner Side)


C
D
3
004 28758
v65
2906
2905
2903
2907
2904
2901
2917
2900
2902
2908
2909
2910
2911
2912
2913
2914
2915
2916
2502
A23
A22
7652
7661
A20
7656
A21
9
8
v33
v34
v35
v36
v37
v38
v39
v40
v41
v42
v43
v44
v45
v46
v47
v48
v49
v50
v51
v52
v53
v54
v55
v71
v56
v57
v58
v59
v60
v61
v62
v63
v64

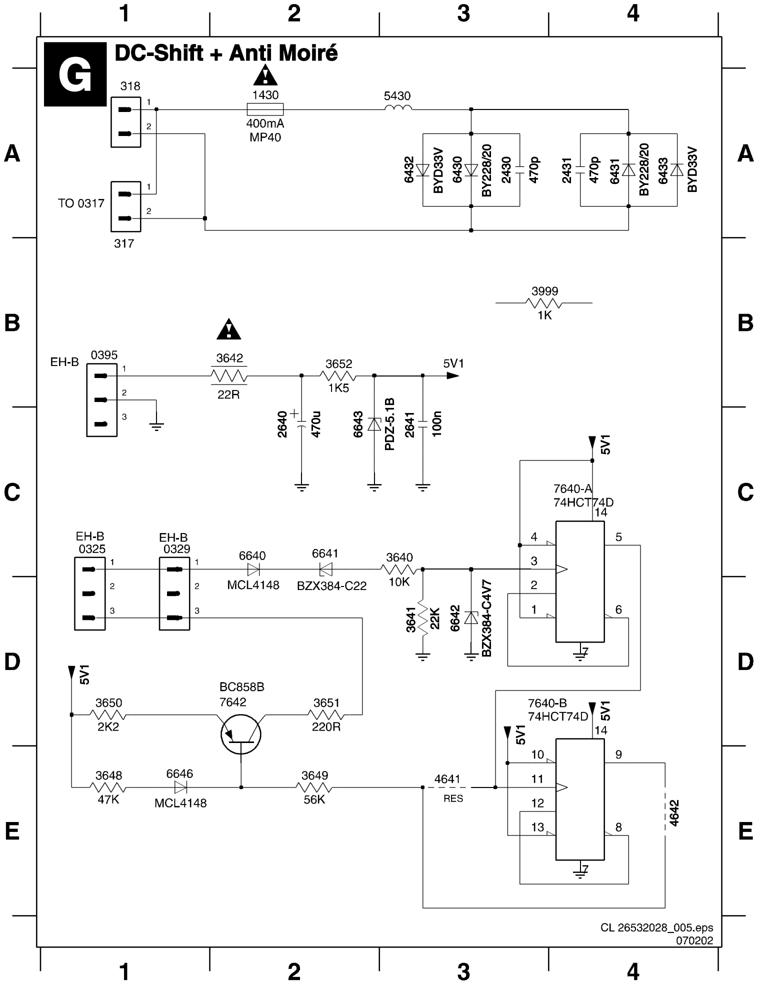
CL 26532028_02d.eps
050202

Layout SSB (Part 3 Tuner Side)


C
D
1
2
S5
V13
S7
V18
V14
V17
2710
S6
8204 004
7716
V16
V15
S8
0681
1701
7702
5704
3719
3720
3721
3722
3798
S4
5706
2712
7713
S3
2653
2661
2662
2504
2505
2503
250
5708
5709
5710
3732
5718
1651
7651
765
2632
2629
2637
A18
A14
A15
A19
3795
3794
3793
4707
4709
4708
7708
0682
0680
5701
5703
5705

CL 26532028_02c.eps
050202

DC-Shift + Anti Moiré

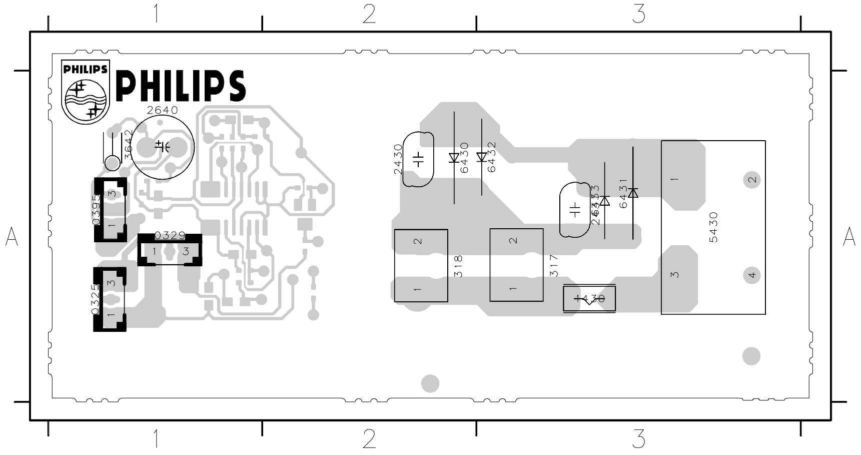

1
2
3
4
A
B
C
D
E
G
DC-Shift + Anti Moiré
318
1430
400mA
MP40
5430
TO 0317
317
6432
BYD33V
6430
BY228/20
2430
470p
2431
470p
6431
BY228/20
6433
BYD33V
3999
1K
EH-B
0395
3642
22R
3652
1K5
5V1
2640
470u
6643
PDZ-5.1B
2641
100n
7640-A
74HCT74D
14
EH-B
0325
EH-B
0329
6640
MCL4148
6641
BZX384-C22
3640
10K
3641
22K
6642
BZX384-C4V7
5V1
BC858B
7642
3650
2K2
3651
220R
7640-B
74HCT74D
3648
47K
6646
MCL4148
3649
56K
4641
RES
4642

CL 26532028_005.eps
070202

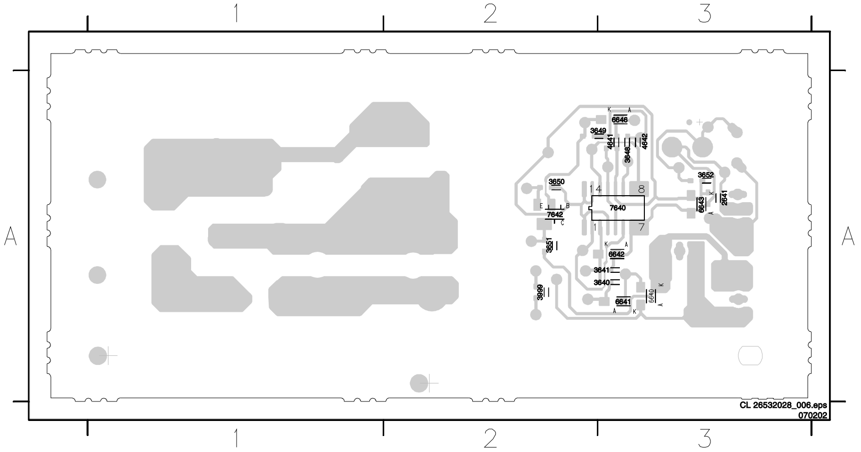
317	B1
318	A1
0325	C1
0329	C1
0395	B1
1430	A2
2430	A3
2431	A4
2640	C2
2641	C3
3640	C3
3641	D3
3642	B2
3648	E1
3649	E2
3650	D1
3651	D2
3652	B2
3999	B3
4641	E3
4642	E4
5430	A3
6430	A3
6431	A4
6432	A3
6433	A4
6640	C2
6641	C2
6642	D3
6643	C2
6646	E1
7640-A	C4
7640-B	D3
7642	D2

Layout DC-Shift + Anti Moiré

0317	A3
0318	A2
0325	A1
0329	A1
0395	A1
1430	A3
2430	A2
2431	A3
2640	A1
3642	A1
5430	A3
6430	A2
6431	A3
6432	A3
6433	A3


1
2
3
A
PHILIPS
2640
3642
0395
0329
0325
2430
6430
6432
318
317
2643
6431
1430
5430

0317	A1
0318	A2
0325	A3
0329	A3
0395	A3
1430	A1
2430	A2
2431	A1
2640	A3
2641	A3
3640	A3
3641	A3
3642	A3
3648	A3
3649	A3
3650	A2
3651	A2
3652	A3
3999	A2
4641	A3
4642	A3
5430	A1
6430	A2
6431	A1
6432	A1
6433	A1
6640	A3
6641	A3
6642	A3
6643	A3
6646	A3
7640	A3
7642	A2


1
2
3
A
6646
3649
3650
3652
7640
7642
6642
3641
3640
3999
6641

CL 26532028_006.eps
070202

Personal Notes:

Personal Notes:

Colour television **Chassis**

EM2E

AA 02.02

Service
Service
Service

Service Information

New Side I/O, Top Control and Mains Switch Panel

In week 225 the following panels are introduced in the set 29PT8607:

- Mains Switch Panel **[K]**
- Side I/O Panel **[L]**
- Top Control Panel **[M]**

In this service information the (changed) schematics, PCB layouts and spare parts list are given. To use the existing Block diagrams, wiring diagrams, I^{2}C overviews, supply line overview and chassis overview the schematics character **[E]** has to be replaced by **[K]**, **[O]** by **[L]** and **[P]** by **[M]**.

Neues Side I/O, Top Control und Mains Switch Panel

In der Woche 225 wurden folgende neue Platinen zusammen mit dem Modell 29PT8607 introduziert:

- Netzschalterplatine (Main-Switch-Panel) **[K]**
- Seitliche E/A-Platine (Side I/O-Panel) **[L]**
- Lokale Ortsbedienung (Top Control Panel) **[M]**

Mit dieser Serviceinformation werden die (änderten) zugehörigen Schaltbilder, das Platinenlayout und die Ersatzteil-Stücklisten veröffentlicht. Um die bereits bestehenden Block- und Verkabelungsdiagramme, die I^{2}C-Bus-Übersicht sowie die Übersichten der Spannungsversorgungsleitungen bzw. der Chassisausführungen weiter nutzen zu können müssen folgenden Einzelschaltbilder ersetzt werden: Diagramm **[E]** durch Diagramm **[K]**, **[O]** durch **[L]** und Diagramm **[P]** durch **[M]**.

Nouvelles platines E/S, Commande supérieure, Platine Commutateur Secteur.

Depuis la semaine 225 les platines suivantes sont introduites dans l'appareil 29PT8607:

- Platine commutateur secteur **[K]**
- Platine E/S de coté **[L]**
- Platine de Commandes en partie supérieure **[M]**

Cette information service done les schémas, implantations et liste des pièces correspondant. Pour utiliser les schémas bloc, de cablage, I^{2}C, alimentation et vue d'ensemble du châssis les repères de schéma **[E]** doivent être remplacés par **[K]**, **[O]** par **[L]** et **[P]** par **[M]**.

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Published by RB 0266 Service PaCE Printed in the Netherlands Subject to modification 3122 785 40640

PHILIPS

Spare parts list

Mains Switch Panel [K]

Various

0157▲	3104 311 02421	Cable 5p 480mm
0177▲	3104 311 03011	Cable 2p 340mm
0201	2422 025 16268	2p male
0202	2422 025 16268	2p male
0203	2422 025 06353	5p male
1910	9322 127 54667	IR receiver TSOP1836UH1
1951	2422 128 02972	Power switch

⊣⊢

2930	4822 124 41584	100µF 20% 10V
2931	4822 124 41796	22µF 20% 16V
2932	4822 124 11913	22nF 20% 275V

-▭-

3957	4822 053 21335	3.3MΩ 5% 0.5W
3966	4822 053 21335	3.3MΩ 5% 0.5W
3978	4822 051 30101	100Ω 5% 62mW
3981	4822 051 30392	3kΩ9 5% 63mW
3982	4822 116 52219	330Ω 5% 0.5W
3985	4822 117 13632	100kΩ 1% 620mW
3986	4822 051 30221	220Ω 5% 62mW
3988	4822 051 30479	47Ω 5% 62mW
3989	4822 051 30102	1kΩ 5% 62mW
3990	4822 117 13632	100kΩ 1% 620mW
3991	4822 050 11002	1kΩ 1% 0.4W

-▶|-

6901	9322 050 99682	LTL-10224WHCR
6954	4822 130 30621	1N4148

-Ⓚ ▭

7900	3198 010 42320	BC857BW
7901	3198 010 42310	BC847BW
7902	4822 130 11418	TCDT1102G

Side I/O panel [L]

Various

0240	2422 025 12485	Conn 11P
1254	4822 267 31014	Headphone socket
1255	4822 265 11606	Conn 3P

⊣⊢

2286	4822 122 33642	150pF 5% 50V
2288	4822 122 33642	150pF 5% 50V
2292	5322 122 32311	470pF 10% 100V
2294	5322 122 32311	470pF 10% 100V
2296	4822 122 30043	10nF 80% 63V
2297	4822 122 30043	10nF 80% 63V

-▭-

3285	4822 116 52201	75Ω 5% 0.5W
3286	4822 116 52176	10Ω 5% 0.5W
3287	4822 116 52201	75Ω 5% 0.5W
3288	4822 116 52176	10Ω 5% 0.5W
3289	4822 116 52249	1k8 5% 0.5W
3291	4822 050 11002	1k 1% 0.4W
3292	4822 117 10834	47k 1% 0.1W
3293	4822 050 11002	1k 1% 0.4W
3294	4822 117 10834	47k 1% 0.1W
3295	4822 116 52276	3k9 5% 0.5W
3296	4822 117 10833	10k 1% 0.1W
3297	4822 117 10833	10k 1% 0.1W

-▶|-

6291	9340 548 61115	PDZ12B
6292	9340 548 61115	PDZ12B
6293	9340 548 61115	PDZ12B
6294	9340 548 61115	PDZ12B

Top Control Panel [M]

Various

0215	4822 267 10748	3P
1091	4822 276 13775	Switch
1092	4822 276 13775	Switch
1093	4822 276 13775	Switch
1094	4822 276 13775	Switch

-▭-

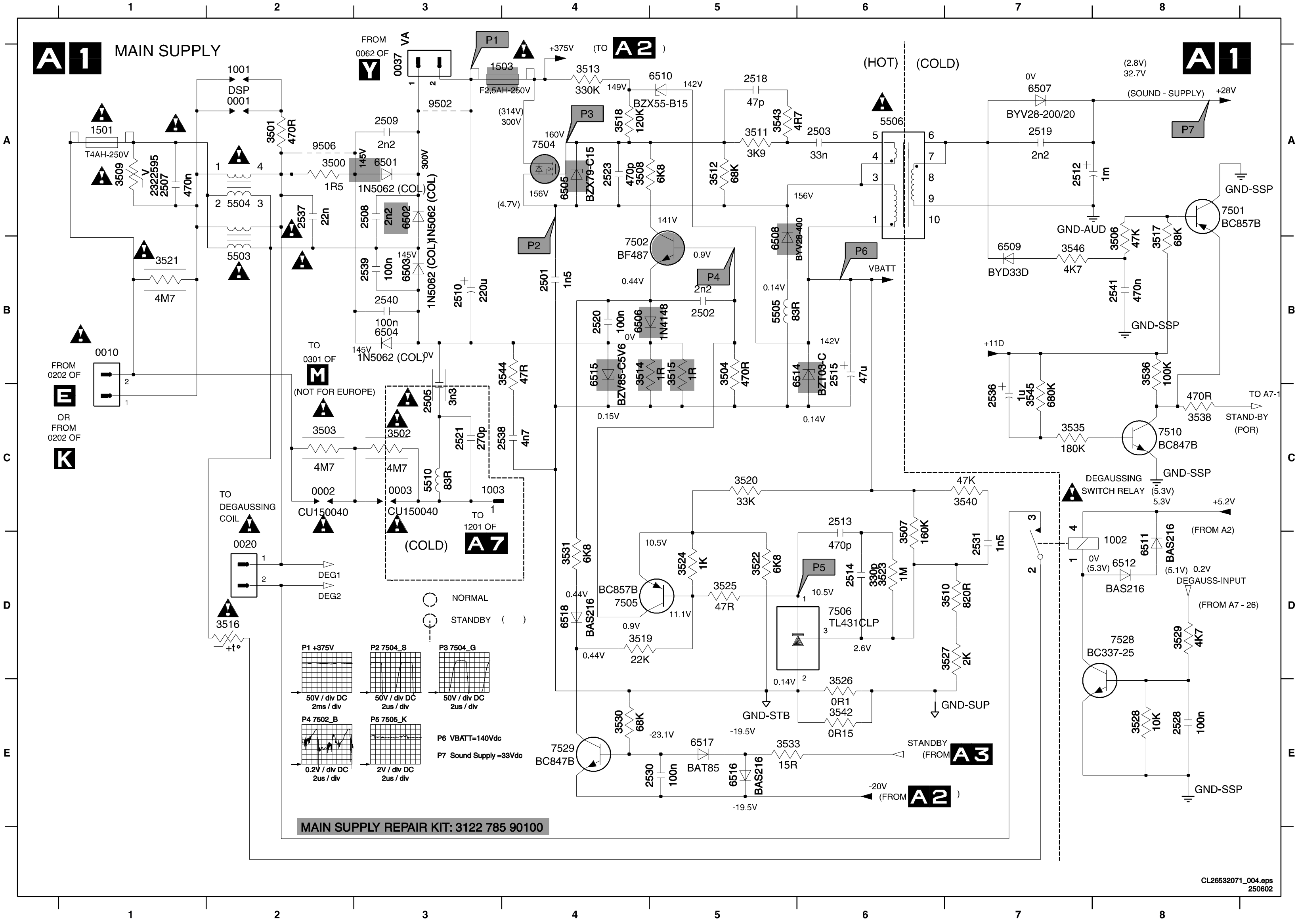
3091	4822 051 20561	560Ω 5% 0.1W
3092	4822 051 20391	390Ω 5% 0.1W
3093	4822 051 20561	560Ω 5% 0.1W
3094	4822 117 11504	270Ω 1% 0.1W
3095	4822 051 20332	3k3 5% 0.1W
3096	4822 117 11139	1k5 1% 0.1W

-▶|-

6091	4822 130 31983	BAT85
8345	4822 320 12511	3P 1500mm

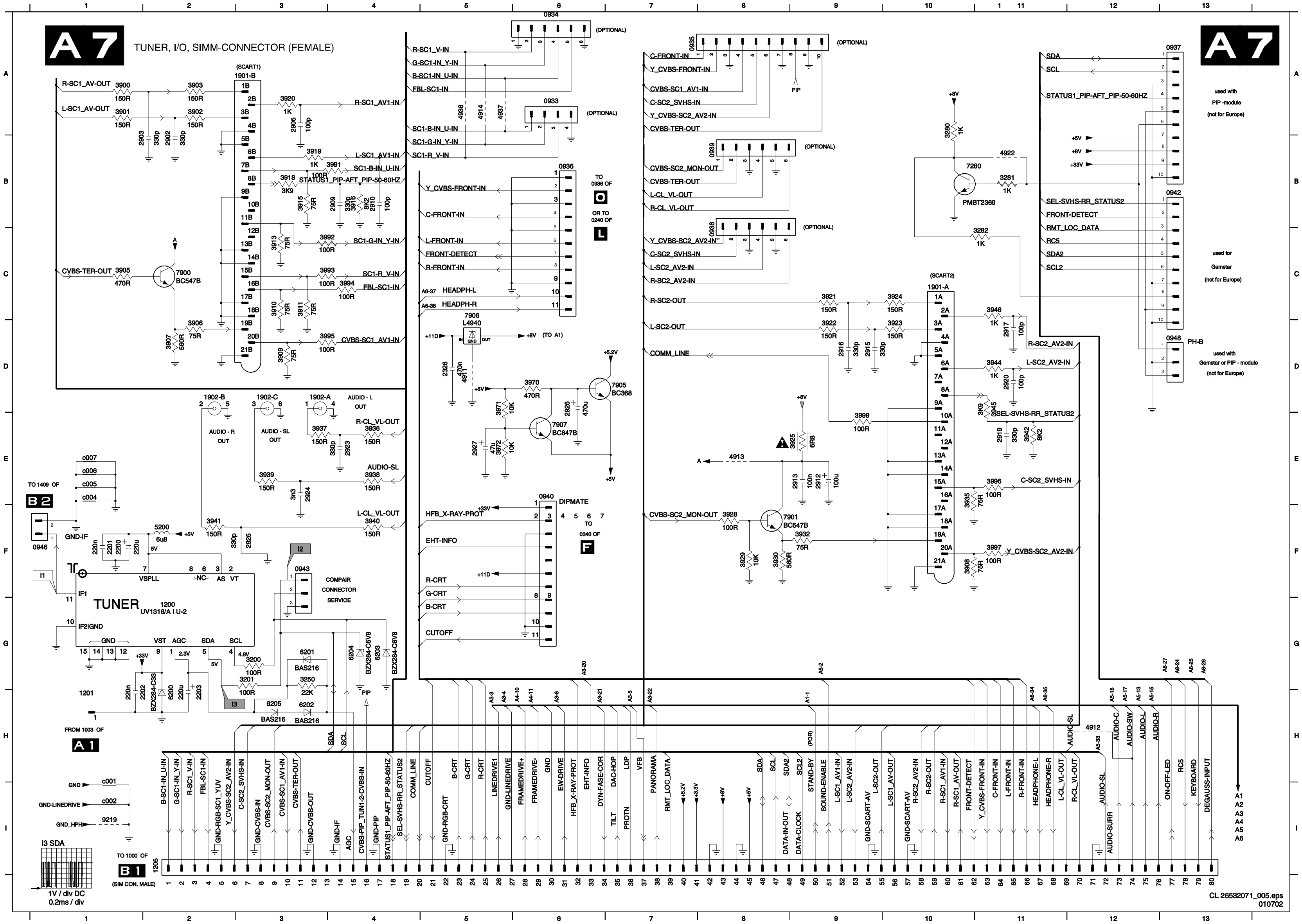
Electrical Diagrams and PWB's

Large Signal Panel: Main Supply


A1 MAIN SUPPLY
1 2 3 4 5 6 7 8
A B C D E
1001 DSP 0001
1501 T4AH-250V
3509 V 2322595 2507 470n
5504 5503
3521 4M7
3501 470R
9506
3500 1R5
6501 1N5062 (COL)
2537 22n
2508 2n2 6502 1N5062 (COL)
2539 100n 6503 1N5062 (COL)
2540 100n
6504 1N5062 (COL)
2509 2n2
9502
300V
2510 220u
FROM 0062 OF Y
0037 VA
P1 1503 F2,5AH-250V
+375V
(TO A2)
3513 330K
149V
6510 BZX55-B15
142V
(314V) 300V
P3 160V
7504
156V
6505 BZX79-C15
2523 470p
3518 120K
3508 6K8
(4.7V)
P2
2501 1n5
141V
7502 BF487
0.9V
P4
0.44V
2520 100n
6506 1N4148
0V
2502 2n2
6515 BZV85-C5V6
3514 1R
3515 1R
3504 470R
3544 47R
0.15V
2518 47p
3543 4R7
3511 3K9
2503 33n
3512 68K
6508 BYV28-400
156V
0.14V
5505 83R
P6 VBATT
142V
6514 BZT03-C
2515 47u
0.14V
(HOT) (COLD)
5506
5 4 3 1 6 7 8 9 10
6507 BYV28-200/20
0V
(2.8V) 32.7V
(SOUND - SUPPLY) +28V
P7
2519 2n2
2512 1m
GND-AUD
6509 BYD33D
3546 4K7
3506 47K
3517 68K
2541 470n
GND-SSP
7501 BC857B
+11D
2536 1u
3545 680K
3536 100K
470R 3538
TO A7-1 STAND-BY (POR)
3535 180K
7510 BC847B
0010
FROM 0202 OF E
OR FROM 0202 OF K
TO 0301 OF M (NOT FOR EUROPE)
2505 3n3
3503 4M7
3502 4M7
0002 CU150040
0003 CU150040
2521 270p
5510 83R
1003 TO 1201 OF A7
2538 4n7
(COLD)
TO DEGAUSSING COIL
0020
DEG1 DEG2
3516 +t°
NORMAL
STANDBY ( )
P1 +375V 50V / div DC 2ms / div
P2 7504_S 50V / div DC 2us / div
P3 7504_G 50V / div DC 2us / div
P4 7502_B 0.2V / div DC 2us / div
P5 7505_K 2V / div DC 2us / div
P6 VBATT=140Vdc
P7 Sound Supply =33Vdc
MAIN SUPPLY REPAIR KIT: 3122 785 90100
3520 33K
3540 47K
10.5V
3524 1K
3522 6K8
BC857B 7505
11.1V
3525 47R
P5 10.5V
2513 470p
2514 330p
3523 1M
3507 160K
2531 1n5
7506 TL431CLP
2.6V
3510 820R
3527 2K
3531 6K8
0.44V
6518 BAS216
0.9V
3519 22K
0.44V
0.14V
3526 0R1
3542 0R15
GND-STB
GND-SUP
3530 68K
-23.1V
-19.5V
7529 BC847B
6517 BAT85
3533 15R
STANDBY (FROM A3
2530 100n
6516 BAS216
-20V (FROM A2)
-19.5V
DEGAUSSING SWITCH RELAY
(5.3V) 5.3V
+5.2V
1002
6511 BAS216
(FROM A2)
0V (5.3V)
6512 BAS216
(5.1V) 0.2V
DEGAUSS-INPUT (FROM A7 - 26)
7528 BC337-25
3529 4K7
3528 10K
2528 100n
GND-SSP
CL26532071_004.eps 250602

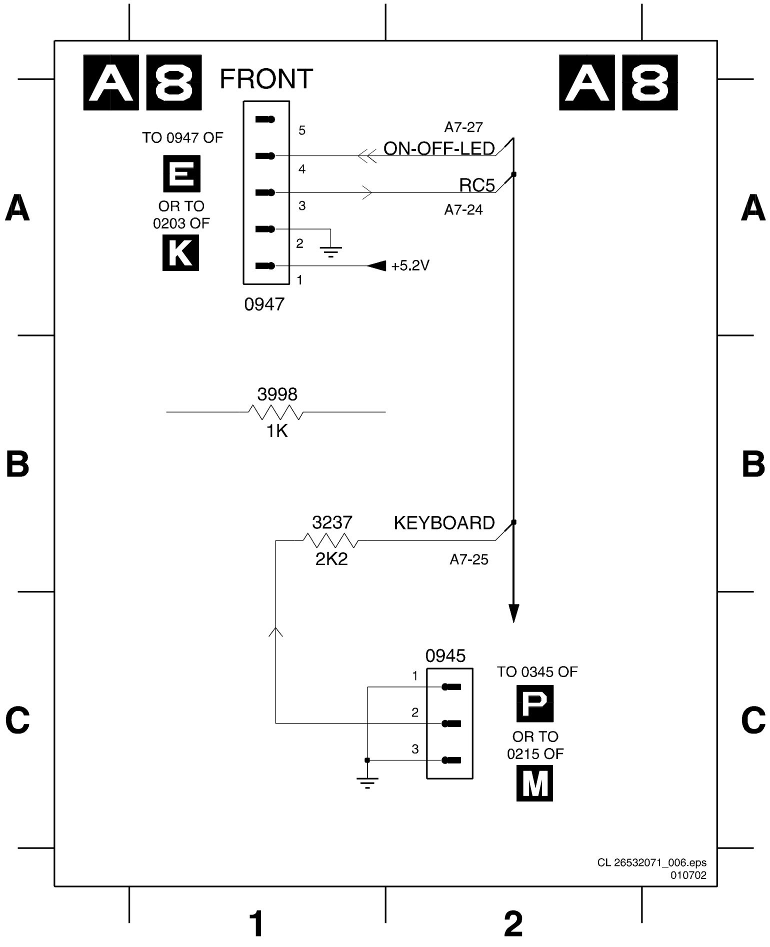
0001	A2
0002	C2
0003	C3
0010	B1
0020	D2
0037	A3
1001	A2
1002	D8
1003	C4
1501	A1
1503	A3
2501	B4
2502	B5
2503	A6
2505	C3
2507	A1
2508	A3
2509	A3
2510	B3
2512	A7
2513	C6
2514	D6
2515	B6
2518	A5
2519	A7
2520	B4
2521	C3
2523	A4
2528	E8
2530	E5
2531	D7
2536	C7
2537	A2
2538	C4
2539	B3
2540	B3
2541	B8
3500	A2
3501	A2
3502	C3
3503	C2
3504	B5
3506	B8
3507	D6
3508	A4
3509	A1
3510	D7
3511	A5
3512	A5
3513	A4
3514	B4
3515	B5
3516	D2
3517	B8
3518	A4
3519	D4
3520	C5
3521	B1
3522	D5
3523	D6
3524	D5
3525	D5
3526	E6
3527	D7
3528	E8
3529	D8
3530	E4
3531	D4
3533	E5
3535	C7
3536	B8
3538	C8
3540	C7
3542	E6
3543	A5
3544	B4
3545	C7
3546	B7
5503	B2
5504	A2
5505	B5
5506	A6
5510	C3
6501	A3
6502	A3
6503	B3
6504	B3
6505	A4
6506	B4
6507	A7
6508	B5
6509	B7
6510	A5
6511	D8
6512	D8
6514	B6
6515	B4
6516	E5
6517	E5
6518	D4
7501	A8
7502	B4
7504	A4
7505	D4
7506	D6
7510	C8
7528	D8
7529	E4
9502	A3
9506	A2

Large Signal Panel: Tuner, I/O, SIMM Connector (Female)


A7
TUNER, I/O, SIMM-CONNECTOR (FEMALE)
(SCART1)
1901-B
R-SC1_AV-OUT
L-SC1_AV-OUT
3900 150R
3901 150R
3903 150R
3902 150R
2903 330p
2902 330p
3920 1K
2906 100p
R-SC1_AV1-IN
3919 1K
3991 100R
L-SC1_AV1-IN
SC1-B-IN_U-IN
3918 3K9
STATUS1_PIP-AFT_PIP-50-60HZ
3915 75R
2909 330p
3916 8K2
2910 100p
3913 75R
3992 100R
SC1-G-IN_Y-IN
CVBS-TER-OUT
3905 470R
7900 BC547B
3993 100R
SC1-R_V-IN
3994 100R
FBL-SC1-IN
3910 75R
3911 75R
3906 75R
3907 560R
3995 100R
CVBS-SC1_AV1-IN
3909 75R
R-SC1_V-IN
G-SC1-IN_Y-IN
B-SC1-IN_U-IN
FBL-SC1-IN
0934 (OPTIONAL)
4936
4914
4937
0933 (OPTIONAL)
SC1-B-IN_U-IN
SC1-G-IN_Y-IN
SC1-R_V-IN
0936
Y_CVBS-FRONT-IN
C-FRONT-IN
L-FRONT-IN
FRONT-DETECT
R-FRONT-IN
HEADPH-L
HEADPH-R
TO 0936 OF O
OR TO 0240 OF L
7906 L4940
+11D
+8V (TO A1)
2326 470n
4911
+5.2V
7905 BC368
3970 470R
3971 10K
2928 470u
7907 BC847B
2927 47u
3972 10K
+5V
1902-B AUDIO - R OUT
1902-C AUDIO - SL OUT
1902-A AUDIO - L OUT
3937 150R
2923 330p
3936 150R
R-CL_VL-OUT
AUDIO-SL
3939 150R
3938 150R
3941 150R
2924 330p
2925 330p
3940 150R
L-CL_VL-OUT
TO 1409 OF B2
0946
GND-IF
5200 6u8
2200 220n
2201 220n
220u
TUNER 1200 UV1316/A I U-2
VSPLL -NC- AS VT
IF1
IF2IGND
GND VST AGC SDA SCL
0943 COMPAIR CONNECTOR SERVICE
I1
I2
I3
1201
2202 220n
BZX284-C33
220u
2203
+33V
3200 100R
3201 100R
6201 BAS216
3250 22K
6205 BAS216
6202 BAS216
6204 BZX284-C6V8
6203 BZX284-C6V8
PIP
FROM 1003 OF A1
0940 DIPMATE
HFB_X-RAY-PROT
EHT-INFO
R-CRT
G-CRT
B-CRT
CUTOFF
TO 0340 OF F
0935 (OPTIONAL)
C-FRONT-IN
Y_CVBS-FRONT-IN
CVBS-SC1_AV1-IN
C-SC2_SVHS-IN
Y_CVBS-SC2_AV2-IN
CVBS-TER-OUT
0939 (OPTIONAL)
CVBS-SC2_MON-OUT
L-CL_VL-OUT
R-CL_VL-OUT
0938 (OPTIONAL)
Y_CVBS-SC2_AV2-IN
L-SC2_AV2-IN
R-SC2_AV2-IN
R-SC2-OUT
L-SC2-OUT
COMM_LINE
3921 150R
3922 150R
2916 330p
2915 330p
3924 150R
3923 150R
(SCART2) 1901-A
3946 1K
2917 100p
R-SC2_AV2-IN
3944 1K
2920 100p
L-SC2_AV2-IN
3999 100R
3945 3K9
SEL-SVHS-RR_STATUS2
2919 330p
3942 8K2
3925 6R8
4913
2913 100n
2912 100u
3996 100R
3935 75R
C-SC2_SVHS-IN
3928 100R
7901 BC547B
3932 75R
3929 10K
3930 560R
3997 100R
3908 75R
Y_CVBS-SC2_AV2-IN
0937
SDA
SCL
STATUS1_PIP-AFT_PIP-50-60HZ
used with PIP -module (not for Europe)
3280 1K
4922
7280 PMBT2369
3281 1K
3282 1K
0942
SEL-SVHS-RR_STATUS2
FRONT-DETECT
RMT_LOC_DATA
RC5
SDA2
SCL2
used for Gemstar (not for Europe)
0948 PH-B
used with Gemstar or PIP - module (not for Europe)
4912
AUDIO-C
AUDIO-SW
AUDIO-L
AUDIO-R
AUDIO-SL
1205 TO 1000 OF B1 (SIM CON. MALE)
I3 SDA 1V / div DC 0.2ms / div
GND
GND-LINEDRIVE
GND_HPH
9219
c001 c002 c004 c005 c006 c007
A1 A2 A3 A4 A5 A6
CL 26532071_005.eps 010702

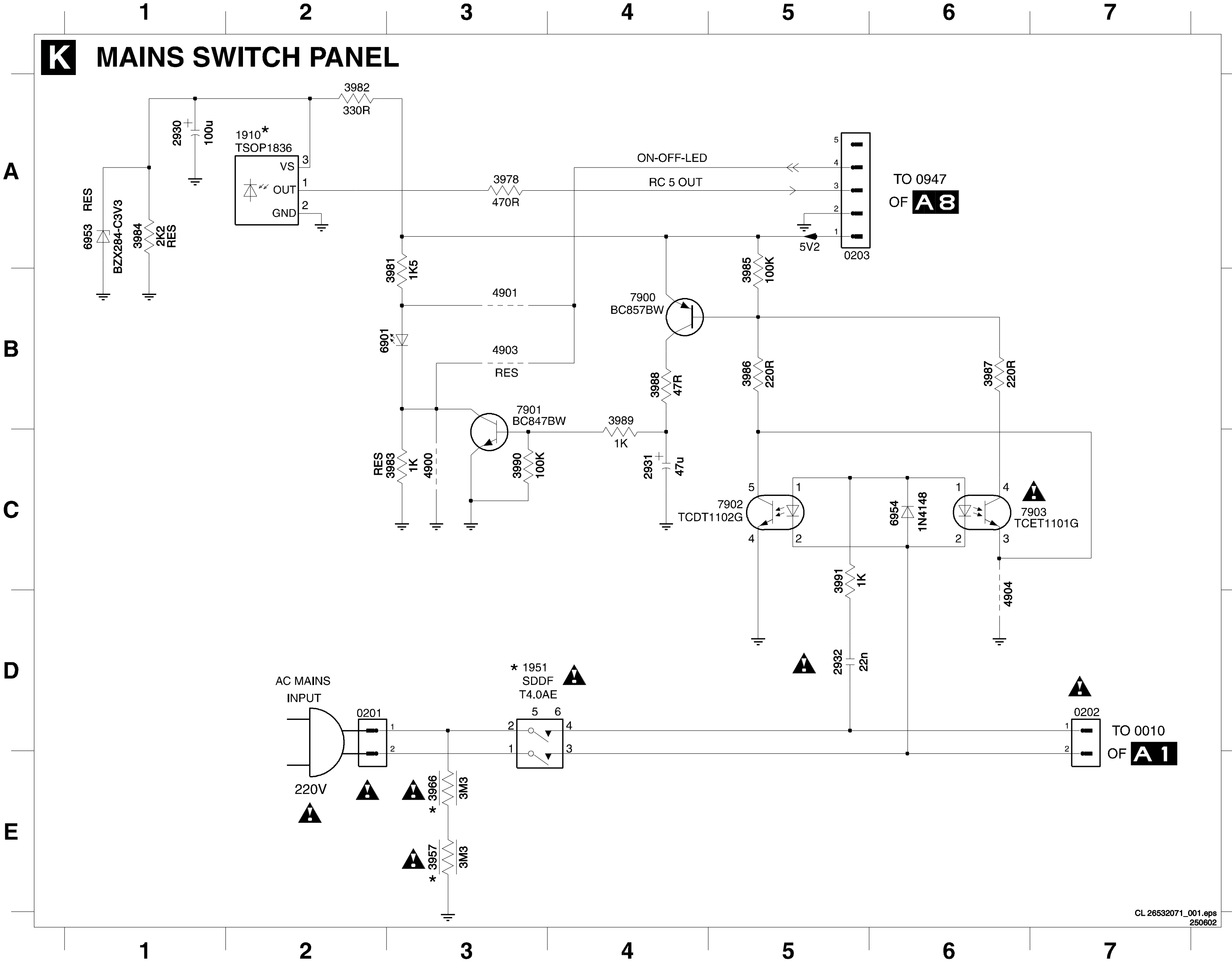
0933	A6
0934	A6
0935	A7
0936	B6
0937	A13
0938	C8
0939	B8
0940	E6
0942	B13
0943	F3
0946	F1
0948	D13
1200	G2
1201	H1
1205	I2
1901-A	C10
1901-B	A2
1902-A	D3
1902-B	D2
1902-C	D3
2200	F1
2201	F1
2202	H1
2203	H2
2902	B2
2903	B2
2906	A3
2909	B4
2910	B4
2912	E9
2913	E9
2915	D9
2916	D9
2917	D11
2919	E11
2920	D11
2923	E4
2924	E3
2925	F3
2926	D6
2927	E5
3200	G3
3201	G3
3250	G3
3280	A10
3281	B11
3282	C11
3900	A1
3901	A1
3902	A2
3903	A2
3905	C1
3906	D2
3907	D2
3908	F10
3909	D3
3910	C3
3911	C3
3913	C3
3915	B3
3916	B4
3918	B3
3919	B3
3920	A3
3921	C9
3922	D9
3923	D10
3924	C10
3925	E9
3928	F8
3929	F8
3930	F8
3932	F9
3935	E10
3936	E4
3937	E3
3938	E4
3939	E3
3940	F4
3941	F2
3942	E11
3944	D11
3945	D11
3946	C11
3970	D6
3971	D5
3972	E5
3991	B4
3992	C3
3993	C3
3994	C4
3995	D3
3996	E11
3997	F11
3999	E9
4911	D5
4912	H12
4913	E8
4914	A5
4922	B11
4934	A12
4936	A5
4937	A5
5200	F2
6200	H2
6201	G3
6202	H3
6203	G4
6204	G4
6205	H3
7280	B11
7900	C2
7901	F8
7905	D7
7906	C5
7907	E6

Large Signal Panel: Front


A8
FRONT
A8
TO 0947 OF
E
OR TO
0203 OF
K
0947
5
4
3
2
1
A7-27
ON-OFF-LED
RC5
A7-24
+5.2V
3998
1K
3237
2K2
KEYBOARD
A7-25
0945
1
2
3
TO 0345 OF
P
OR TO
0215 OF
M
CL 26532071_006.eps
010702
A
B
C
1
2

0945 C2
0947 A1
3237 B1
3998 B1

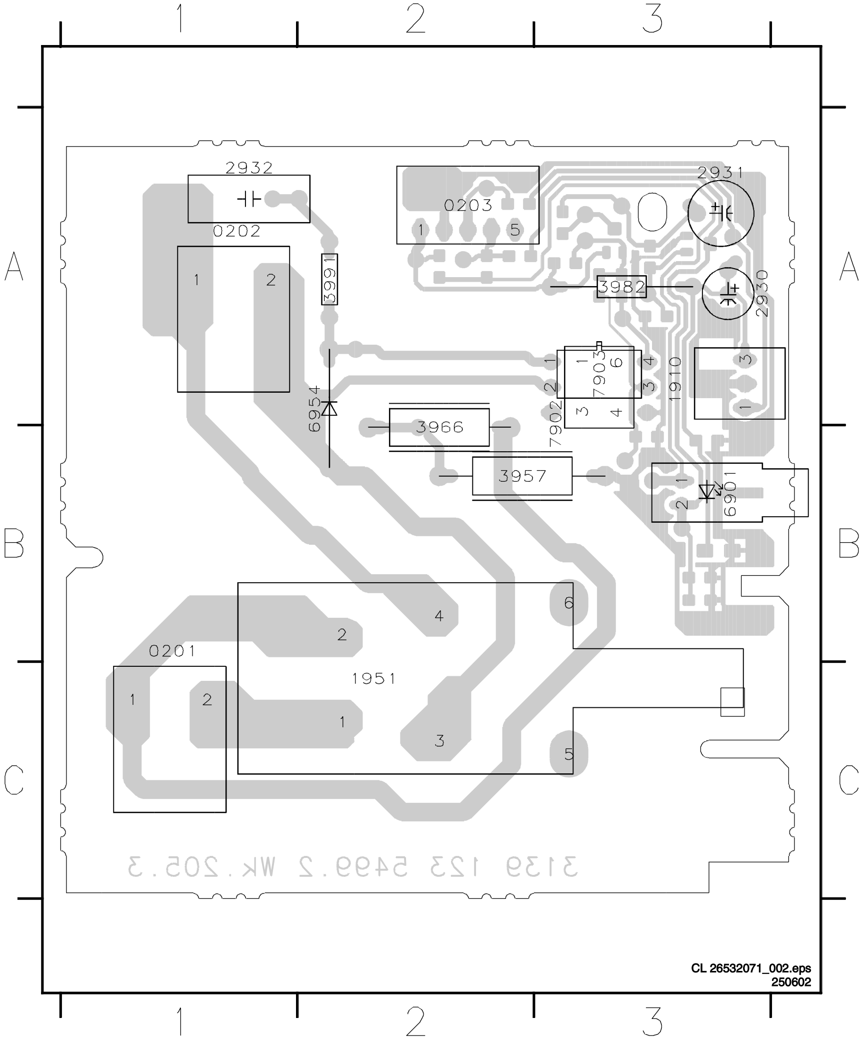
Mains Switch Panel


1 2 3 4 5 6 7
A B C D E
K MAINS SWITCH PANEL
3982
330R
2930
100u
1910*
TSOP1836
VS
OUT
GND
3
1
2
RES
6953
BZX284-C3V3
3984
2K2
RES
ON-OFF-LED
3978
470R
RC 5 OUT
5
4
3
2
1
5V2
0203
TO 0947
OF A8
3981
1K5
4901
4903
RES
6901
7900
BC857BW
3985
100K
3986
220R
3987
220R
3988
47R
7901
BC847BW
3989
1K
RES
3983
1K
4900
3990
100K
2931
47u
7902
TCDT1102G
6954
1N4148
7903
TCET1101G
3991
1K
4904
2932
22n
AC MAINS
INPUT
220V
0201
* 1951
SDDF
T4.0AE
5 6
2 4
1 3
* 3966
3M3
* 3957
3M3
0202
TO 0010
OF A1
CL 26532071_001.eps
250602

0201	D2
0202	D7
0203	A5
1910	A2
1951	D3
2930	A1
2931	C4
2932	D5
3957	E3
3966	E3
3978	A3
3981	B3
3982	A2
3983	C3
3984	A1
3985	B5
3986	B5
3987	B6
3988	B4
3989	B4
3990	C3
3991	C5
4900	C3
4901	B3
4903	B3
4904	D6
6901	B3
6953	A1
6954	C6
7900	B4
7901	B3
7902	C5
7903	C6
F903	D3
F904	D6
F905	D3
F906	D6
F907	A5
F908	A5
F909	A5
F910	C2
I901	A1
I902	B3
I903	A2
I904	B2
I905	E3
I906	B5
I907	B4
I908	B5
I909	C6
I910	C4
I911	C4
I912	C6
I913	A5
I914	D5
I915	E3

Layout Mains Switch Panel (Top Side)

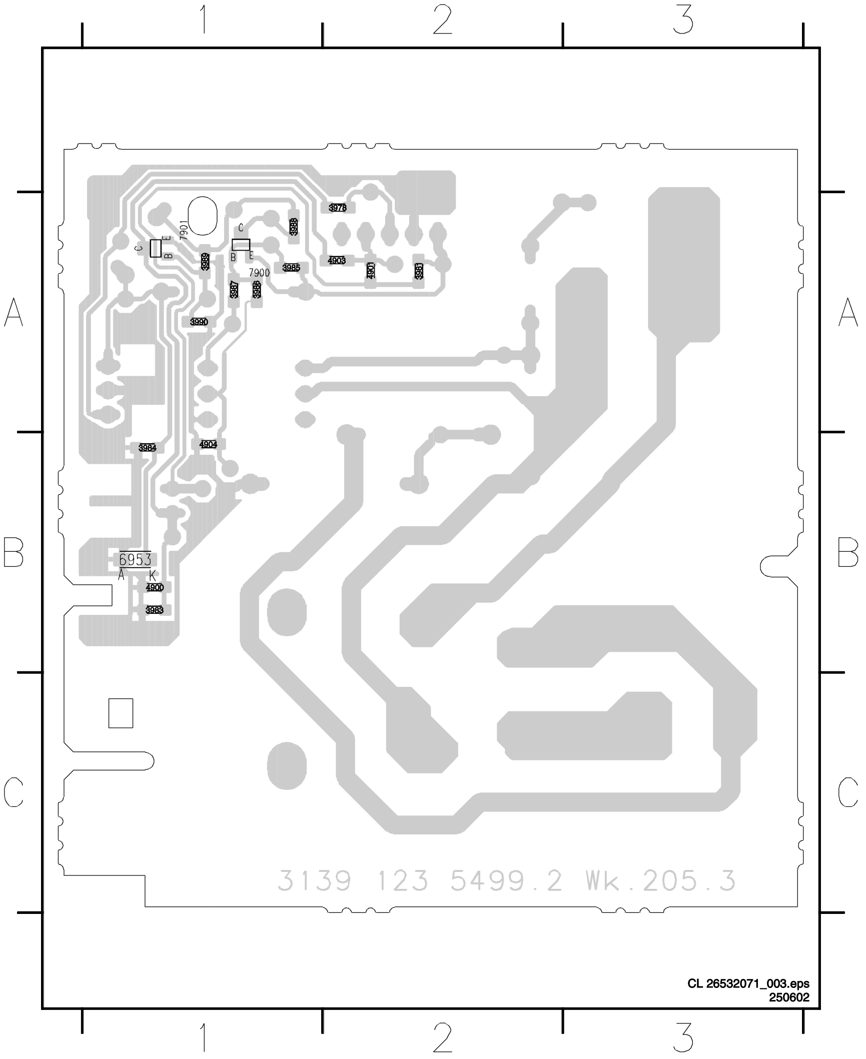
0201	B1	0203	A2	1951	C2	2931	A3	3957	B2	3982	A3	6901	B3	7902	A3
0202	A1	1910	A3	2930	A3	2932	A1	3966	B2	3991	A2	6954	A2	7903	A3


1
2
3
A
B
C
2932
0202
1
2
3991
0203
1
5
2931
3982
2930
6954
1
2
3
4
7903
6
3
4
7902
1910
3
1
3966
3957
1
2
6901
6
4
2
1951
0201
1
2
1
3
5
3139 123 5499.2 Wk.205.3

CL 26532071_002.eps
250602

Layout Mains Switch Panel (Bottom Side)

3978	A2	3984	B1	3987	A1	3990	A1	4903	A2	7900	A1
3981	A2	3985	A1	3988	A1	4900	B1	4904	B1	7901	A1
3983	B1	3986	A1	3989	A1	4901	A2	6953	B1		

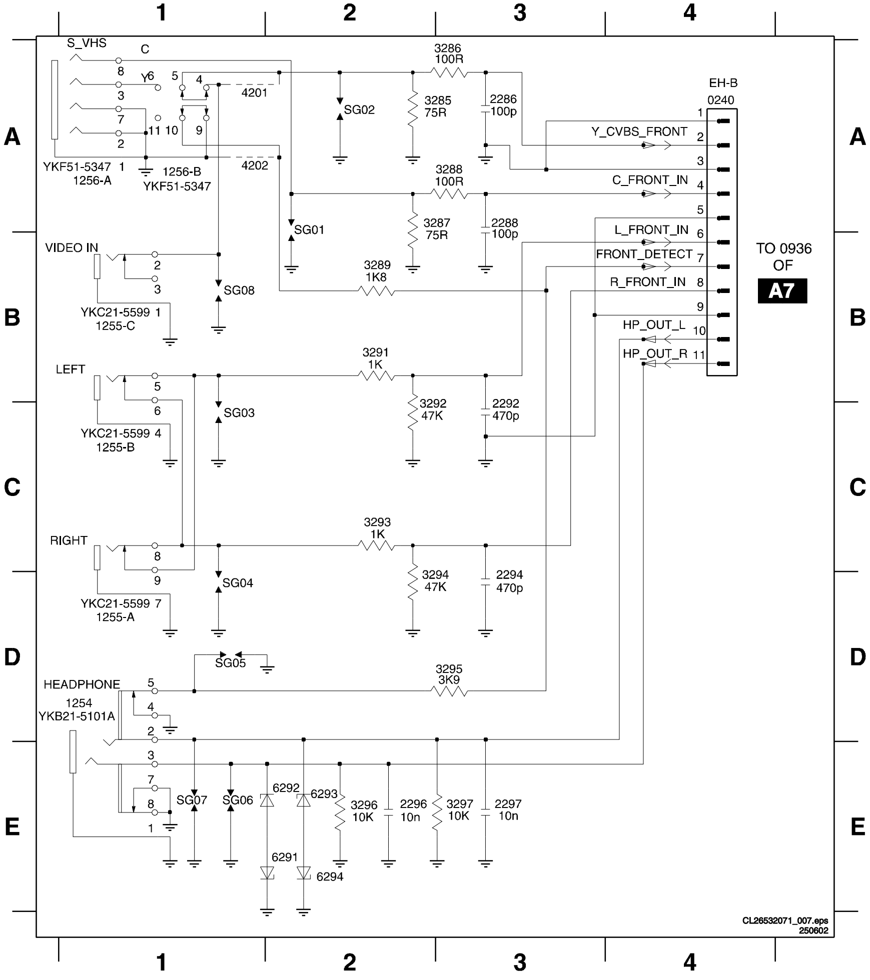

1
2
3
A
B
C
3978
7901
C
B
E
3988
7900
3985
4903
4901
3981
3989
3987
3986
3990
3984
4904
6953
A
K
4900
3983
3139 123 5499.2 Wk.205.3

CL 26532071_003.eps
250602

Side I/O Panel

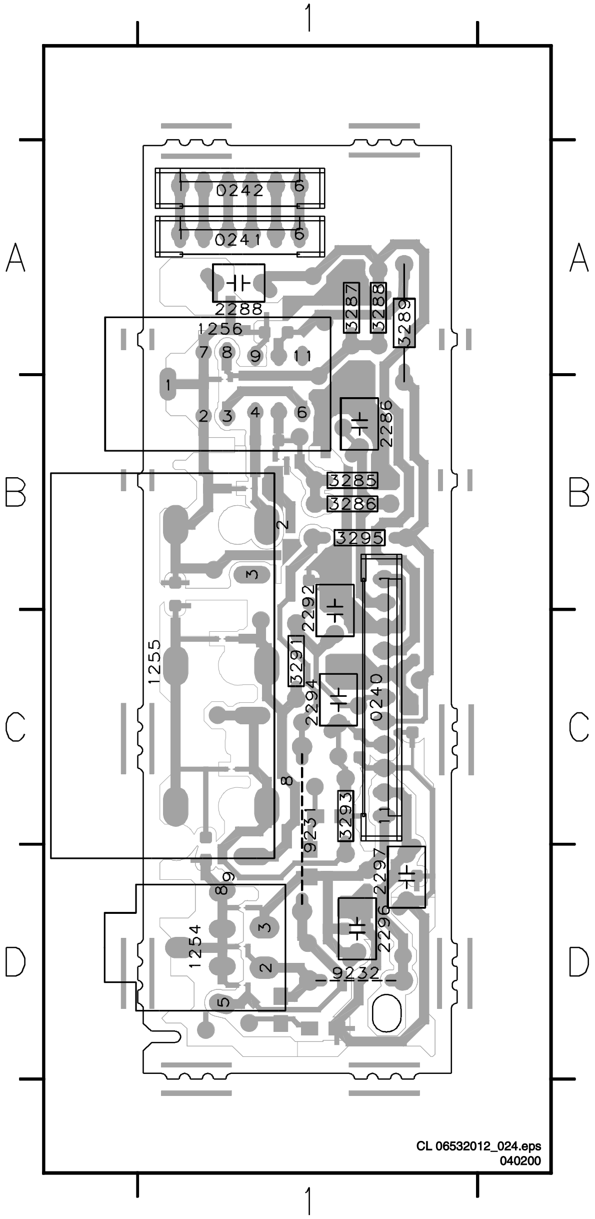
L SIDE IO PANEL

0240	A4
1254	D1
1255-A	D1
1255-B	C1
1255-C	B1
1256-A	A1
1256-B	A1
2286	A3
2288	A3
2292	B3
2294	C3
2296	E2
2297	E3
3285	A3
3286	A3
3287	A3
3288	A3
3289	B2
3291	B2
3292	B2
3293	C2
3294	C3
3295	D3
3296	E2
3297	E3
4201	A1
4202	A1
6291	E2
6292	E2
6293	E2
6294	E2
SG01	B2
SG02	A2
SG03	C1
SG04	D1
SG05	D1
SG06	E1
SG07	E1
SG08	B1


1
2
3
4
A
B
C
D
E
S_VHS
C
Y
YKF51-5347 1
1256-A
1256-B
YKF51-5347
4201
4202
SG02
SG01
3286
100R
3285
75R
2286
100p
3288
100R
3287
75R
2288
100p
3289
1K8
EH-B
0240
Y_CVBS_FRONT
C_FRONT_IN
L_FRONT_IN
FRONT_DETECT
R_FRONT_IN
HP_OUT_L
HP_OUT_R
TO 0936
OF
A7
VIDEO IN
YKC21-5599 1
1255-C
SG08
LEFT
YKC21-5599 4
1255-B
SG03
3291
1K
3292
47K
2292
470p
RIGHT
YKC21-5599 7
1255-A
SG04
3293
1K
3294
47K
2294
470p
SG05
HEADPHONE
1254
YKB21-5101A
3295
3K9
SG07
SG06
6292
6293
6291
6294
3296
10K
2296
10n
3297
10K
2297
10n
CL26532071_007.eps
250602

Personal Notes:

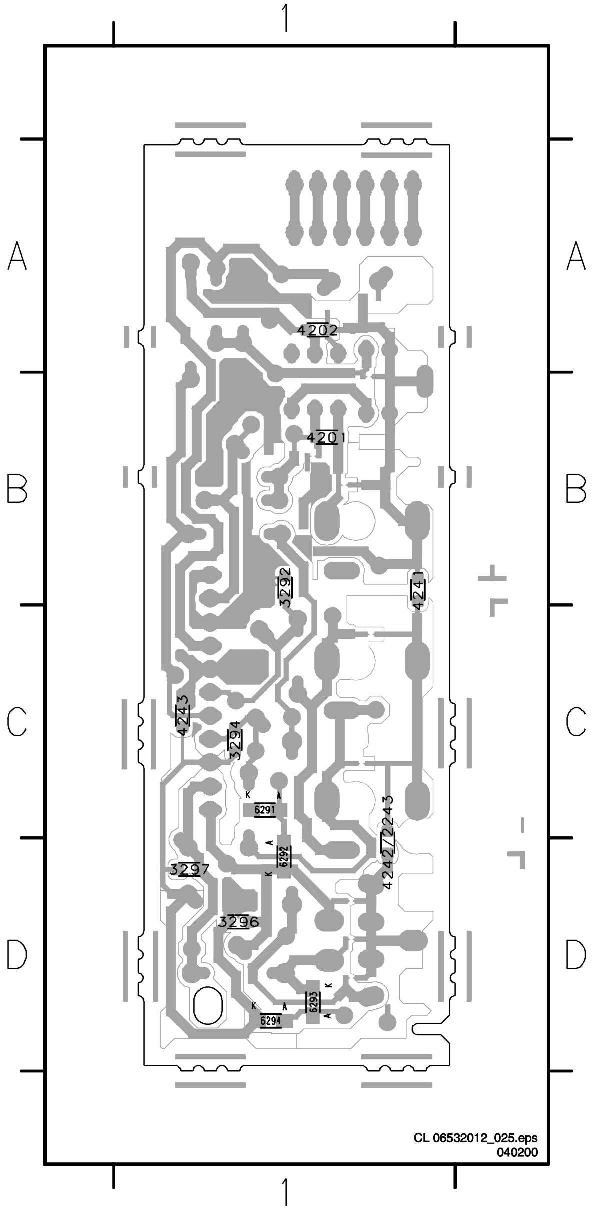
Layout Side I/O Panel (Top Side)


1
A
B
C
D
0242
0241
2288
1256
3287
3288
3289
2286
3285
3286
3295
2292
3291
2294
0240
1255
3293
9231
2297
2296
1254
9232

CL 06532012_024.eps
040200

0240	C1
0241	A1
0242	A1
1254	D1
1255	C1
1256	A1
2286	B1
2288	A1
2292	B1
2294	C1
2296	D1
2297	D1
3285	B1
3286	B1
3287	A1
3288	A1
3289	A1
3291	C1
3293	C1
3295	B1
9231	C1
9232	D1

Layout Side I/O Panel (Bottom Side)

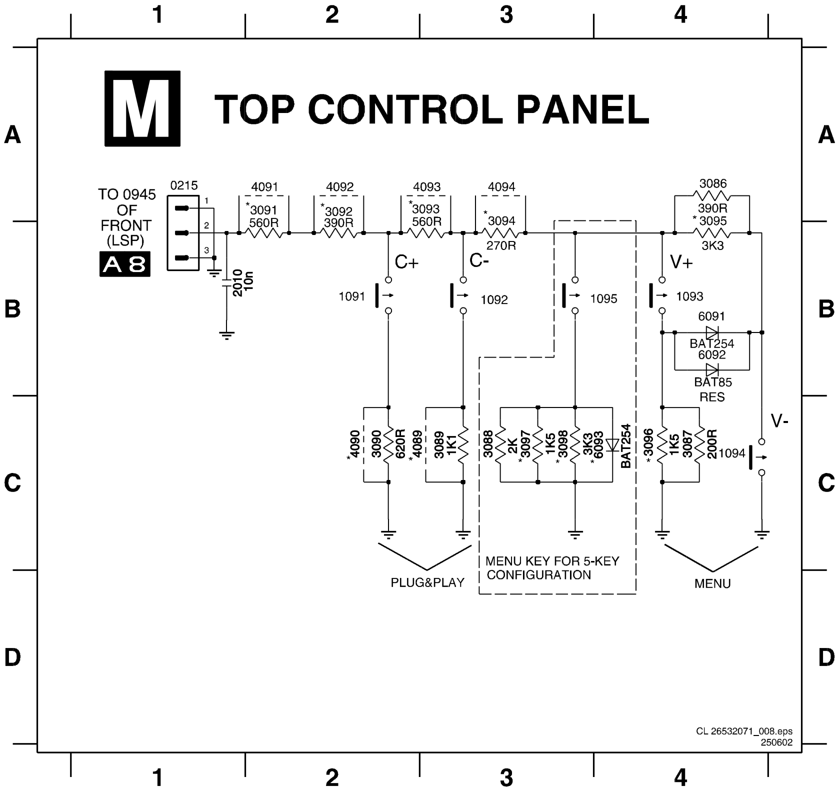

1
A
B
C
D
4202
4201
3292
4241
4243
3294
6291
6292
4242/2243
3297
3296
6293
6294

CL 06532012_025.eps
040200

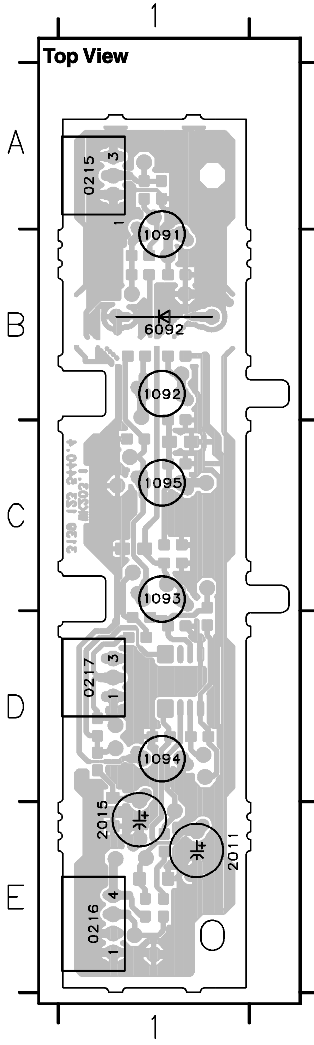
3292	B1
3294	C1
3296	D1
3297	D1
4201	B1
4202	A1
4241	B1
4242/2243	D1
4243	C1
6291	C1
6292	D1
6293	D1
6294	D1

Top Control Panel

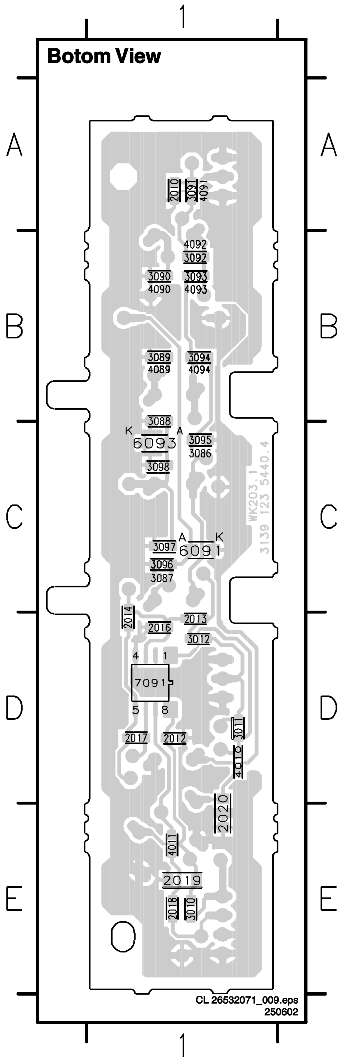
0215	A1
1091	B2
1092	B3
1093	B4
1094	C4
1095	B4
2010	B1
3086	A4
3087	C4
3088	C3
3089	C3
3090	C2
3091	A2
3092	A2
3093	A3
3094	B3
3095	B4
3096	C4
3097	C3
3098	C3
4089	C3
4090	C2
4091	A2
4092	A2
4093	A3
4094	A3
6091	B4
6092	B4
6093	C4


1
2
3
4
A
B
C
D
M
TOP CONTROL PANEL
TO 0945 OF FRONT (LSP)
A8
0215
1
2
3
2010
10n
4091
*3091
560R
4092
*3092
390R
4093
*3093
560R
4094
*3094
270R
3086
390R
*3095
3K3
C+
C-
V+
V-
1091
1092
1095
1093
1094
6091
BAT254
6092
BAT85
RES
*4090
3090
620R
*4089
3089
1K1
3088
2K
*3097
1K5
*3098
3K3
*6093
BAT254
*3096
1K5
3087
200R
PLUG&PLAY
MENU KEY FOR 5-KEY CONFIGURATION
MENU
CL 26532071_008.eps
250602

Layout Top Control Panel


Top View
1
A
B
C
D
E
0215
0216
0217
1091
1092
1093
1094
1095
2011
2015
6092

0215	A1
0216	E1
0217	D1
1091	B1
1092	B1
1093	C1
1094	D1
1095	C1
2011	E1
2015	E1
6092	B1


Botom View
1
A
B
C
D
E
2010
3091
4091
4092
3092
3090
4090
3093
4093
3089
4089
3094
4094
3088
6093
3095
3086
3098
3097
6091
3096
3087
2014
2016
2013
3012
7091
2017
2012
3011
4010
2020
4011
2019
2018
3010
CL 26532071_009.eps
250602

2010	A1
2012	D1
2013	D1
2014	D1
2016	D1
2017	D1
2018	E1
2019	E1
2020	E1
3010	E1
3011	D1
3012	D1
3086	C1
3087	C1
3088	B1
3089	B1
3090	B1
3091	A1
3092	B1
3093	B1
3094	B1
3095	C1
3096	C1
3097	C1
3098	C1
4010	D1
4011	E1
4089	B1
4090	B1
4091	A1
4092	B1
4093	B1
4094	B1
6091	C1
6093	C1
7091	D1